Vol. 900 Number 1

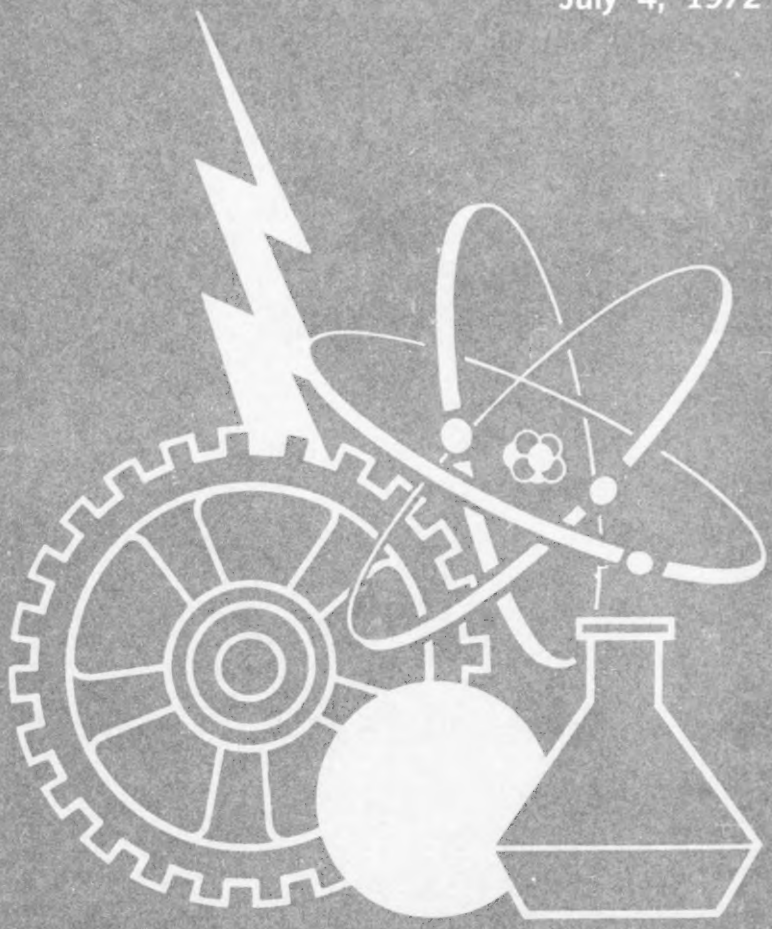
OFFICIAL GAZETTE

of the
UNITED STATES PATENT OFFICE

A UNITED STATES DEPARTMENT OF COMMERCE PUBLICATION

PATENTS

July 4, 1972



U. S. DEPARTMENT OF COMMERCE

Patent Office

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the UNITED STATES PATENT OFFICE

July 4, 1972 Volume 900 Number 1

CONTENTS

	Page
Patents and Trademark Notices	
Board of Appeals Decisions Rendered in the Month of May 1972	2
Trademarks—Proposed Adoption of International Classification	2
Patent Suits	3
Patent Notices	
Certificates of Correction for the Week of July 4, 1972	5
Service by Publication	5
Adverse Decisions in Interferences	5
Condition of Patent Applications	6
Reissue Patents Granted	7
Plant Patents Granted	10
Patents Granted	
General and Mechanical	11
Chemical	213
Electrical	300
Design Patents Granted	391
Index of Patentees	PI 1
Indices of Reissues, Plants, and Designs	PI 50
Classification of	
Patents (Including Reissues)	PI 53
Designs and Plants	PI 56
Geographical Index of Residence of Inventors	
Patents (Including Reissues)	PI 57
Designs and Plants	PI 59

The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENTS SECTION), issued weekly, subscription $89.00 per annum, foreign mailing $22.25 additional; single copies $2.00 each.

THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly, subscription $17.00 per annum, foreign mailing $4.25 additional; single copies 40 cents each.

CIRCULARS OF GENERAL INFORMATION concerning PATENTS or TRADEMARKS, price 15 cents each.

PRINTED COPIES OF PATENTS are furnished by the Patent Office at 50 cents each; PLANT PATENTS in color, $1.00 each; copies of TRADEMARKS and DESIGN PATENTS at 20 cents each. Address orders to the Commissioner of Patents, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.O.

PATENT OFFICE NOTICES

Board of Appeals Decisions Rendered in the Month of May 1972

Examiner affirmed	166
Examiner affirmed in part	10
Examiner reversed	24
Total	200

Trademarks—Proposed Adoption of International Classification

On March 29, 1972, the Patent Office published a notice of proposed rule making in the Federal Register at 37 F.R. 6404. That notice proposed to amend Rule 6.1 of the Trademark Rules of Practice. A public hearing on the proposed amendment was held on June 14, 1972 in Arlington, Virginia, and interested persons were given the opportunity to submit comments regarding the proposed amendment until that date. It has come to our attention that the Federal Register notice never appeared in the OFFICIAL GAZETTE.

In order to insure that all interested persons have had an opportunity to comment, the date for written comments is hereby extended to August 18, 1972.

The notice as it appeared in the Federal Register is reproduced below.

ROBERT GOTTSCHALK,
Commissioner of Patents.

Date: June 9, 1972.

Proposed Rule Making

CLASSIFICATION OF GOODS AND SERVICES

[37 CFR Part 6]

International Schedule

The Patent Office proposes to establish the "International Classification of Goods and Services to Which Trademarks Are Applied" (the subject of the "Nice Agreement Concerning the International Classification of Goods and Services for the Purposes of the Registration of Marks" of 1957 as revised at Stockholm, on July 14, 1967) as the primary classification of goods and services for registration of trademarks and service marks.

The Patent Office has studied the International Classification and, since March 5, 1968, has indicated the appropriate international class in all publications and on all issued registrations and renewals, as a subsidiary classification. Based on this experience, it is now believed that adoption of the international schedule as the primary classification is desirable. The international schedule is in use in more than 60 countries and is the subject of the aforementioned Nice Agreement to which the United States has recently become a party. The Nice Agreement provides for an International Committee of Experts whose task is to keep the classification current. The classification of specific goods and services is set forth in an alphabetical list entitled "International Classification of Goods and Services to Which Trademarks Are Applied" (published by the World Intellectual Property Organization). This listing is currently used by the office as a guideline for determining the degree of particularity of identification of goods. See "Identification of Goods and Services in Trademark Applications," 895 O.G. 390, TM 54.

Specifically it is proposed that all applications for registration of marks and renewals of registrations having a filing date later than September 30, 1972, be classified according to the International Classification for all administrative purposes set forth in the Trademark Act. Accordingly, the international classification would be the sole criteria for determining fees and classification of goods and services. Applications and renewals which are pending at the close of business on September 30, 1972, would continue to be processed under the present classification system. However, the Office would continue to mark all such published applications and registrations with the appropriate international class as a subsidiary classification as it has been doing for several years.

It is not proposed that the existing documents in the Trademark Search Room be reclassified. The U.S. classification system would continue to be used for purposes of searching registered and pending marks until such time as a complete conversion of the Trademark Search Room file to the international classification system is effected. Until such conversion is made, the U.S. class number would continue to be printed on all registrations in addition to the international class number so that searches can be made on the basis of the existing U.S. system. It should be noted that approximately 53 percent of these documents are indexed alphabetically, without regard to class. The remaining 47 percent of the files are organized under approximately 50 headings (e.g., common prefixes such as SAN, GOLD, etc. and numerals, letters, design features, etc.) and under each, the documents are filed by class. This portion of the search file would be maintained as at present, i.e. classified according to the present schedule of classes. Until such time as all documents in the search room include the international classification, the documents organized by class would continue to be filed according to the present U.S. classification.

For an interim period (i.e., until all marks pending as of September 30, 1972, have been disposed of) the trademark sections of the OFFICIAL GAZETTE which are organized by class would include two parts, one part for applications published or marks issued on the basis of applications filed prior to October 1, 1972, organized by class according to the existing schedule of classes; the other for applications published or marks issued on the basis of applications filed after September 30, 1972, organized by class according to the new international schedule. All publications of applications will show both the U.S. and the international class number.

None of the above changes apply to certification marks and collective membership marks which would continue to be classified as set forth in §§ 6.2 and 6.3.

All persons are invited to present their views, objections, recommendations, or suggestions in connection with the proposed change to the Commissioner of Patents, Washington, D.C. 20231, on or before June 14, 1972, on which date a hearing will be held at 2 p.m. e.d.s.t., in Room 8C06, Building 2, 2011 Jefferson Davis Highway, Arlington, Va. All persons wishing to be heard at the hearing are requested to notify the Commissioner of Patents of their intended appearance. Any written comments or suggestions may be inspected by any person upon written request a reasonable time after the closing date for submitting comments.

Notice is hereby given, therefore, that, pursuant to the authority contained in section 6 of the Act of July 19, 1952 (66 Stat. 792; 35 U.S.C. 6) and in section 30 of the Trademark Act of 1946, as amended (October 9, 1962, 76 Stat. 773; 16 U.S.C. 1112), the Patent Office proposes to amend Title 37 of the Code of Federal Regulations by revising § 6.1.

ROBERT GOTTSCHALK,
Commissioner of Patents.

Dated: March 21, 1972.

Approved:

JAMES H. WAKELIN, JR.,
Assistant Secretary
for Science and Technology.

§ 6.1. SCHEDULE OF CLASSES OF GOODS AND SERVICES

Goods

1. Chemical products used in industry, science, photography, agriculture, horticulture, forestry; artificial and synthetic resins; plastics in the form of powders, liquids or pastes, for industrial use; manures (natural and artificial); fire extinguishing compositions; tempering substances and chemical preparations for soldering; chemical substances for preserving foodstuffs; tanning substances; adhesive substances used in industry.

2. Paints, varnishes, lacquers; preservatives against rust and against deterioration of wood; coloring matters, dyestuff; mordants; natural resins; metals in foil and powder form for painters and decorators.

3. Bleaching preparations and other substances for laundry use; cleaning, polishing, scouring, and abrasive preparations; soaps; perfumery, essential oils, cosmetics, hair lotions; dentifrices.

4. Industrial oils and greases (other than edible oils and fats and essential oils); lubricants; dust laying and absorbing compositions; fuels (including motor spirit) and illuminants; candles, tapers, night lights and wicks.

5. Pharmaceutical, veterinary, and sanitary substances; infants' and invalids' foods; Plasters, material for bandaging; material for stopping teeth, dental wax; disinfectants; preparations for killing weeds and destroying vermin.

6. Unwrought and partly wrought common metals and their alloys; anchors, anvils, bells, rolled and cast building materials; rails and other metallic materials for railway tracks; chains (except driving chains for vehicles); cables and wires (nonelectric); locksmiths' work; metallic pipes and tubes; safes and cash boxes; steel balls; horseshoes; nails and screws; other goods in nonprecious metal not included in other classes; ores.

7. Machines and machine tools; motors (except for land vehicles); machine couplings and belting (except for land vehicles); large size agricultural implements; incubators.

8. Hand tools and instruments; cutlery, forks, and spoons; side arms.

9. Scientific, nautical, surveying and electrical apparatus and instruments (including wireless), photographic, cinematographic, optical, weighing, measuring, signalling, checking (supervision), lifesaving and teaching apparatus and instruments; coin or counterfreed apparatus; talking machines; cash registers calculating machines; fire extinguishing apparatus.

10. Surgical, medical, dental, and veterinary instruments and apparatus (including artificial limbs, eyes, and teeth).

11. Installations for lighting, heating, steam generating, cooking, refrigerating, drying, ventilating, water supply and sanitary purposes.

12. Vehicles; apparatus for locomotion by land, air, or water.

13. Firearms; ammunition and projectiles; explosive substances; fireworks.

14. Precious metals and their alloys and goods in precious metals or coated therewith (except cutlery, forks, and spoons); jewellery, precious stones, horological, and other chronometric instruments.

15. Musical instruments (other than talking machines and wireless apparatus).

16. Paper and paper articles, cardboard and cardboard articles; printed matter, newspaper and periodicals, books; bookbinding material; photographs; stationery, adhesive materials (stationery); artists' materials; paint brushes; typewriters and office requisites (other than furniture); instructional and teaching material (other than apparatus); playing cards; printers' type and cliches (stereotype).

17. Gutta percha, indiarubber, balata, and substitutes, articles made from these substances and not included in other classes; plastics in the form of sheets, blocks, and rods, being for use in manufacture; materials for packing, stopping, or insulating; asbestos, mica and their products; hose pipes (nonmetallic).

18. Leather and imitations of leather, and articles made from these materials and not included in other classes; skins, hides; trunks and traveling bags; umbrellas, parasols, and walking sticks; whips, harness, and saddlery.

19. Building materials, natural and artificial stone, cement, lime, mortar, plaster, and gravel; pipes of earthernware or cement; roadmaking materials; asphalt, pitch, and bitumen; portable buildings; stone monuments; chimney pots.

20. Furniture, mirrors, picture frames; articles (not included in other classes) of wood, cork, reeds, cane, wicker, horn bone, ivory, whalebone, shell, amber, mother-of-pearl, meerschaum, celluloid, substitutes for all these materials, or of plastics.

21. Small domestic utensils and containers (not of precious metals, or coated therewith); combs and sponges; brushes (other than paint brushes); brushmaking materials; instruments and material for cleaning purposes, steel wool; unworked or semiworked glass (excluding glass used in building); glassware, porcelain, and earthernware, not included in other classes.

22. Ropes, string, nets, tents, awnings, tarpaulins, sails, sacks; padding and stuffing materials (hair, kapok, feathers, seaweed, etc.); raw fibrous textile materials.

23. Yarns, threads.

24. Tissues (piece goods); bed and table covers; textile articles not included in other classes.

25: Clothing, including boots, shoes, and slippers.

26. Lace and embroidery, ribands and braid; buttons, press buttons, hooks and eyes, pins and needles; artificial flowers.

27. Carpets, rugs, mats, and matting; linoleums and other materials for covering existing floors; wall hangings (nontextile).

28. Games and playthings; gymnastic and sporting articles (except clothing); ornaments and decorations for Christmas trees.

29. Meat, fish, poultry, and game; meat extracts; preserved, dried and cooked fruits and vegetables; jellies, jams; eggs, milk, and other dairy products; edible oils and fats; preserves, pickles.

30. Coffee, tea, cocoa, sugar, rice, tapioca, sago, coffee substitutes; flour, and preparations made from cereals; bread, biscuits, cakes, pastry and confectionery, ices; honey, treacle; yeast, baking powder; salt, mustard, pepper, vinegar, sauces, spices; ice.

31. Agricultural, horticultural, and forestry products and grains not included in other classes; living animals; fresh fruits and vegetables; seeds; live plants and flowers; foodstuffs for animals, malt.

32. Beer, ale, and porter; mineral and aerated waters and other nonalcoholic drinks; syrups and other preparations for making beverages.

33. Wines, spirits, and liqueurs.

34. Tobacco, raw or manufactured; smokers' articles; matches.

Services

35. Advertising and business.
36. Insurance and financial.
37. Construction and repair.
38. Communication.
39. Transportation and storage.
40. Material treatment.
41. Education and entertainment.
42. Miscellaneous.

[FR Doc. 72-4744 Filed 3-28-72; 8:47 am]

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,892,911, D. W. Crouch, VACUUM-TYPE CIRCUIT INTERRUPTER; **2,892,912,** Greenwood, Lee and Schneider, same; **3,246,979,** Lafferty, Barkan, Lee and Talento, VACUUM CIRCUIT INTERRUPTER CONTACTS; **3,263,162,** Lucek and Pearce, APPARATUS AND METHOD FOR MEASURING THE PRESSURE INSIDE A VACUUM CIRCUIT INTERRUPTER, filed Oct. 12, 1971, D.C., W.D.N.Y. (Buffalo), Doc. C-1971-452. *General Electric Company* v. *Westinghouse Electric Corporation.*

2,892,912. (See 2,892,911.)

2,897,481, D. H. Shepard, APPARATUS FOR READING, filed Dec. 20, 1971, D.C. District of Columbia (Washington), Doc. 2530-71, *John W. Davidge, Jr., as trustee of Farrington Electronics, Inc. et al.* v. *The National Cash Register Co.*

2,936,899, P. Tashman, TRAY OR PAN CABINETS, filed Mar. 17, 1970, D.C., S.D. Fla. (Miami), Doc. 70-344-C-JLK. *Precision Metal Products, Inc.* v. *Brunor, Inc. and Brunor Onori.* Cause dismissed without prejudice, Nov. 24, 1971.

2,951,761, J. T. Stephan, FISH BAIT, filed Feb. 9, 1972, D.C., W.D. Wis. (Madison), Doc. 72-C-50. *Puget Sound Salmon Egg Company, Inc. and John Thomas Stephan* v. *Uncle Josh Bait Company and James J. Vander Mause.*

2,956,073, Whetstone and Harman, INSECTICIDALLY ACTIVE ESTERS OF PHOSPHORUS ACIDS AND PREPARATION OF THE SAME; **Reg. No. 709,813** (VAPONA), Shell Oil Company, filed Mar. 22, 1965, D.C., N.D. Iowa (Cedar Rapids), Doc. 65-C-508-EC, *Shell Oil Company* v. *Barco Corporation and John Barakat.* Defendants enjoined and restrained from infringing Patent 2,956,073 and Trademark Reg. No. 709,813 for remaining term of patent and as long as said trademark registration shall be effective, Oct. 15, 1971.

2,974,467, W. R. Long, PICKUP AND THRESHING UNIT FOR PEANUT COMBINE, **3,007,475,** same, PEANUT COMBINE, filed Nov. 4, 1971, U.S. Ct. of App., 4th Cir., Va. (Richmond), Doc. 71-2016 and 2017, *Long Manufacturing Company* v. *Lilliston Implement Company.*

2,979,119, H. Kramer, WEB-TO-TUBE FASTENINGS; **3,042,113,** same; **3,092,117,** same, **filed** Mar. 31, 1965, D.C., S.D.N.Y., Doc. 65–C–968, *Hyman Kramer, doing business as Hy Kramer Enterprises* v. *Living Aluminum, Inc. et al.* Agreement and stipulation of dismissal of action and counterclaim with prejudice, Oct. 27, 1971.

3,007,475. (See 2,974,467.)

3,016,308, N. Macaulay, RECORDING PAPER COATED WITH MICROSCOPIC CAPSULES OF COLORING MATERIAL, CAPSULES AND METHOD OF MAKING, **filed** Jan. 25, 1972, D.C., W.D.N.Y. (Buffalo), Doc. C–1972–47, *Moore Business Forms, Inc.* v. *Minnesota Mining and Manufacturing Company.*

3,042,113. (See 3,092,177.)

3,092,177. (See 2,979,119.)

3,108,409, O. Hendrickson, PNEUMATIC FILING MACHINE; **3,274,895,** same, DOUBLE PISTON PNEUMATIC FILING MACHINE; **3,399,494,** same, AIR OPERATED SANDING MACHINE, **filed** Oct. 28, 1971, D.C., C.D. Calif. (Los Angeles), Doc. 71–2582–CC, *Allan Air Products, Inc.* v. *Harvey Rodstein, Rodac Pneumatic Tools, Inc., Rodac International Corp.*

3,150,224, N. A. Libman, APPARATUS FOR MAKING STEEL SHOT; **3,245,840,** same, ABRASIVE MATERIAL AND METHOD OF MAKING SAME; **3,259,529,** same, ABRASIVE MATERIAL, **filed** Dec. 5, 1966, D.C., S.D. Ohio (Cincinnati), Doc. 6306, *Metal Blast, Inc.* v. *Steel Abrasives, Inc. et al.* Stipulation of dismissal, Oct. 15, 1971.

3,177,703, Waters, Helfer and Jones, METHOD AND APPARATUS FOR RUNNING AND TESTING AN ASSEMBLY FOR SEALING BETWEEN WELLHEAD CONDUITS; **3,179,448,** M. R. Jones, WELLHEAD APPARATUS; **3,419,071,** Williams and Gruller, UNDERWATER WELLHEAD APPARATUS; **3,481,396,** same, CONNECTOR FOR UNDERWATER PIPELINES, **filed** Oct. 21, 1971, D.C., S.D. Tex. (Houston), Doc. 71–H–1153, *Cameron Iron Works, Inc.* v. *Vetco Offshore Industries Inc., Vetco-Texas, Inc.*, **same, filed** Feb. 10, 1972, D.C., C.D. Calif. (Los Angeles), Doc. 72–313–CC, *Vetco Offshore Industries, Inc. and Vetco Offshore, Inc.* v. *Cameron Iron Works, Inc.*

3,179,448. (See 3,177,703.)

3,245,840. (See 3,150,224.)

3,246,979. (See 2,892,911.)

3,259,529. (See 3,150,224.)

3,263,162. (See 2,892,911.)

3,274,895. (See 3,108,409.)

3,296,052, A. M. Bechtold, MEANS AND METHOD FOR POSTFORMING PLASTIC LAMINATED PRODUCTS; **3,296,056,** same, MEANS FOR POSTFORMING PLASTIC LAMINATED PRODUCTS, **filed** Apr. 23, 1970, D.C., E.D. Calif. (Fresno), Doc. F–405–C, *Roberts Consolidated Industries, Inc.* v. *Frank Monschein, doing business as Campus Plastic Products.* Case dismissed by plaintiff, July 27, 1970.

3,296,056. (See 3,296,052.)

3,390,532, J. B. Lawrence, APPARATUS FOR LAYING PIPELINES; **3,487,648,** same, METHODS FOR LAYING PIPELINES, **filed** Oct. 27, 1971, D.C., N.D. Tex. (Dallas), Doc. CA–3–5225–C, *Brown & Root, Inc.* v. *Sedco, doing business as Houston Contracting Company.*

3,399,494. (See 3,108,409.)

3,419,071. (See 3,177,703.)

3,476,191, C. V. Schlabs, UNIVERSAL HITCH FOR TOWING TILLING IMPLEMENTS; **3,539,015,** same, TANDEM PLOW PACKERS, **filed** Nov. 1, 1971, D.C., N.D. Tex. (Lubbock), Doc. CA–5–970, *Charles V. Schlabs* v. *Stanton Supply Corporation.*

3,481,396. (See 3,177,703.)

3,487,648. (See 3,390,532.)

3,496,635, McLean, Chatfield and Turner, REMOVABLE HAND LEVER AND WEAR COMPENSATING CAN OPENER CONSTRUCTION; **3,520,056,** R. J. Scott, REMOVABLE HAND LEVER CONSTRUCTION, **filed** Nov. 30, 1971, D.C., W.D. Mo. (Kansas City), Doc. 19903–4, *General Electric Company* v. *Rival Manufacturing Company.* Notice of voluntary dismissal, Dec. 30, 1971.

3,520,056. (See 3,496,635.)

3,539,015. (See 3,476,191.)

D. 212,825, R. A. Claridge, PITCHER; **D. 212,826,** same, COMBINED PITCHER AND COVER THEREFOR, **filed** May 6, 1969, D.C., W.D.N.C. (Charlotte), Doc. 2475, *Alprod Corporation* v. *Southeastern Plastics Corporation.* Stipulation and order of dismissal under FRCP 41(a)(c), Dec. 21, 1971.

D. 212,826. (See D. 212,825.)

D. 221,797, R. H. Annesley, RING, **filed** Jan. 19, 1972, D.C., E.D. Tex. (Austin), Doc. A–72–CA–6, *Stuckey & Speer, Inc.* v. *John Roberts, Incorporated.*

Reg. No. 709,813. (See 2,956,073.)

Certificates of Correction for the Week of July 4, 1972

Re. 26,885	3,622,324	3,629,999	3,639,117
3,531,549	3,622,376	3,630,145	3,639,230
3,533,967	3,622,438	3,630,484	3,639,338
3,557,160	3,622,587	3,630,622	3,639,379
3,564,683	3,622,601	3,630,630	3,639,598
3,574,955	3,622,649	3,630,670	3,639,822
3,576,383	3,622,660	3,630,678	3,639,914
3,577,521	3,622,667	3,630,729	3,639,915
3,578,258	3,623,151	3,630,833	3,640,383
3,579,362	3,623,416	3,630,933	3,640,515
3,583,840	3,623,418	3,630,935	3,640,633
3,585,988	3,623,528	3,630,957	3,640,711
3,591,067	3,623,726	3,630,980	3,640,771
3,592,284	3,623,746	3,630,997	3,640,778
3,592,325	3,623,806	3,631,043	3,640,807
3,592,837	3,624,018	3,631,186	3,640,914
3,593,334	3,624,024	3,631,243	3,641,000
3,595,751	3,624,120	3,631,328	3,641,052
3,599,324	3,624,128	3,631,340	3,641,367
3,599,969	3,624,549	3,631,412	3,641,397
3,601,731	3,625,029	3,631,432	3,641,534
3,602,916	3,625,229	3,632,092	3,641,881
3,603,144	3,625,268	3,632,311	3,641,921
3,607,343	3,625,306	3,632,541	3,642,644
3,607,749	3,625,595	3,632,569	3,642,759
3,608,057	3,625,624	3,632,666	3,642,771
3,609,514	3,625,712	3,632,679	3,642,850
3,611,869	3,625,791	3,632,710	3,643,316
3,612,014	3,625,830	3,632,776	3,643,361
3,613,854	3,625,846	3,632,784	3,643,756
3,613,907	3,625,976	3,632,883	3,643,876
3,613,983	3,625,997	3,632,947	3,643,918
3,614,517	3,626,017	3,633,018	3,644,138
3,614,567	3,626,256	3,633,064	3,644,498
3,615,268	3,626,388	3,634,081	3,644,532
3,615,821	3,626,482	3,634,091	3,644,572
3,616,012	3,626,606	3,634,202	3,644,585
3,618,037	3,626,799	3,634,419	3,644,664
3,618,169	3,626,821	3,634,880	3,644,884
3,618,512	3,626,962	3,634,894	3,645,433
3,618,629	3,627,287	3,635,061	3,645,476
3,618,719	3,627,640	3,635,128	3,645,678
3,618,778	3,627,727	3,635,369	3,645,769
3,619,111	3,627,839	3,635,460	3,645,780
3,619,155	3,627,954	3,635,653	3,646,027
3,619,427	3,627,974	3,635,754	3,646,327
3,619,564	3,627,977	3,635,826	3,646,447
3,620,493	3,628,023	3,635,900	3,646,528
3,620,663	3,628,182	3,635,922	3,646,708
3,620,733	3,629,084	3,635,963	3,647,086
3,621,223	3,629,090	3,636,113	3,647,269
3,621,441	3,629,097	3,636,224	3,647,616
3,621,742	3,629,137	3,636,310	3,647,667
3,621,900	3,629,206	3,636,389	3,648,097
3,622,035	3,629,304	3,638,504	3,650,185
3,622,178	3,629,373	3,638,527	3,650,692
3,622,219	3,629,424	3,638,591	3,651,140
3,622,312	3,629,590	3,639,054	

Service by Publication

Mahmoud Muftic

In accordance with Rule 47 of the Rules of Practice of the United States Patent Office in Patent Cases, notice is hereby given of the filing on October 31, 1968, of an application for patent entitled "5-Nitro-Furfurylidene Antimicrobic Agents," on behalf of Mahmoud Muftic, whose last known address is Cornavin-Geneve, Switzerland. The application was made in compliance with Rule 47(a) and 35 U.S.C. 116 by joint inventors Rudolf Albrecht and Eberhard Schroder without execution by the said Mahmoud Muftic. Notice of the filing directed to the above noted address has been returned undelivered.

Any action to be taken by the said Mahmoud Muftic in connection with the said application must be taken within thirty days of the publication of this notice.

/s/ F. H. BRONAUGH,
for RICHARD A. WAHL,
June 7, 1972. *Assistant Commissioner of Patents.*

Adverse Decisions in Interferences

In the designated interferences involving the indicated claim of the following patents final decisions have been rendered that the respective patentees were not the first inventors with respect to the claims listed.

Patent No. 3,270,016, M. Duennenberger, H. R. Biland and C. Luethi, ARYL-1,3,5-TRIAZINES, decided Feb. 11, 1972, Interference No. 97,117, claims 1, 2 and 3.

Patent No. 3,278,534, M. Schellenbaum, C. Luethi and M. Duennenberger, NEW HYDROXYPHENYL-1,3,5-TRIAZINES, decided Feb. 11, 1972, Interference No. 97,119, claims 1 and 2.

Patent No. 3,293,247, M. Duennenberger, H. R. Biland, C. Luethi and M. Schellenbaum, HYDROXYPHENYL-1,3,5-TRIAZINES, decided Feb. 11, 1972, Interference No. 97,118, claims 1, 2, 3, 5, 7, 8 and 9.

Patent No. 3,293,249, H. R. Biland, C. Luethi and M. Duennenberger, HYDROXYPHENYL-TRIAZINES AND PROCESS FOR THEIR MANUFACTURE, decided Feb. 11, 1972, Interference No. 97, 116, claims 1 and 2.

Patent No. 3,330,981, M. A. Ala, PHOSPHOR COATED ARTICLES, decided Nov. 17, 1971, Interference No. 97,005, claim 1.

Patent No. 3,343,742, L. Siegler, PARTITION, decided Jan. 19, 1972, Interference No. 96,790, claims 1 and 2.

Patent No. 3,378,376, M. Sebring, EGG WHITE COMPOSITION, METHOD OF PREPARING AND PROCESS UTILIZING SAME, decided Jan. 31, 1972, Interference No. 96,680, claims 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 and 11.

Patent No. 3,386,082, T. S. Stafford, D. C. Burnstine, G. T. Paul and J. R. Rogaski, CONFIGURATION CONTROL IN MULTIPROCESSORS, decided Jan. 27, 1972, Interference No. 96,917, claims 1, 2, 3, 15 and 17.

Patent No. 3,446,837, V. H. Wallingford, 3-(N-SUBSTITUTED - ACYLAMINO) - 2,4,6 - TRIIODOPHENYL FATTY ACID COMPOUNDS, decided May 26, 1972, Interference No. 97,664, claim 10.

Patent No. 3,501,401, C. Calmon, CONDENSATION PURIFICATION PROCESS, decided May 19, 1972, Interference No. 97,584, claims 1 thru 10.

Patent No. 3,501,424, S. Imoto, K. Ikari and T. Hattori, COATING COMPOSITION CONTAINING ALKALINE AND NON-ALKALINE PIGMENT WITH BINDER AND DISPERSANT, decided May 19, 1972, Interference No. 97,781, claims 1, 2, 3 and 5.

Patent No. 3,511,233, E. Holy, FOOT PROTECTOR, decided May 24, 1972, Interference No. 97,636, claims 1, 2 and 4.

PATENT EXAMINING CORPS

R. A. WAHL, Assistant Commissioner
F. H. BRONAUGH, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JUNE 13, 1972

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M. STERMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	4-05-71
GENERAL ORGANIC CHEMISTRY, GROUP 120—I. MARCUS, Director. Heterocyclic; Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	1-11-71
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—L. J. BERCOVITZ, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	3-03-71
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—A. P. KENT, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	3-01-71
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—W. B. KNIGHT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	12-30-70
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS AND RELATED ELEMENTS, GROUP 210—N. ANSHER, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Miscellaneous.	10-19-71
SECURITY, GROUP 220—R. L. CAMPBELL, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	3-03-71
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	6-02-71
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—W. L. CARLSON, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	5-06-71
PHYSICS, GROUP 280—R. L. EVANS, Director. Photography; Sound and Lighting; Indicators and Optics; Measuring and Testing; Geometrical Instruments.	4-12-71
DESIGNS, GROUP 290—R. L. CAMPBELL, Director. Industrial Arts; Household, Personal and Fine Arts.	2-01-71
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—A. BERLIN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Railways and Railway Equipment; Brakes; Rigid Flexible and Special Receptacles and Packages.	5-12-71
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders Woodworking; Tools; Cutlery; Jacks.	3-15-71
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—A. RUEGG, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	3-25-71
HEAT, POWER AND FLUID ENGINEERING, GROUP 340—M. M. NEWMAN, Director. Power Plants; Combustion Engines; Fluid Motors; Pumps; Turbines; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Vaporizing; Temperature and Humidity Regulation; Machine Elements; Power Transmission; Fluid Handling; Lubrication; Joint Packing.	6-07-71
CONSTRUCTIONS, SUPPORTS, TEXTILES, CLEANING, GROUP 350—T. J. HICKEY, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structurec; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Receptacles; Supports; Cabinet Structures; Centrifugal Separations; Cleaning; Coating; Pressing; Agitating; Foods; Textiles; Apparel and Shoes; Sewing Machines; Winding and Reeling.	4-12-71

Expiration of patents: The patents within the range of numbers indicated below expire during July 1972, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 2,712,131 to 2,714,206, inclusive
Plant Patents ..... Numbers 1,404 to 1,407, inclusive

REISSUES

JULY 4, 1972

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

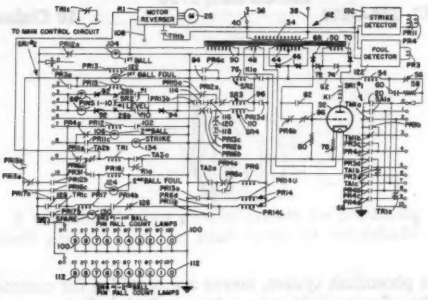
27,416
CONTROL MECHANISM FOR BOWLING PIN SPOTTING MACHINE

Richard D. Walsh, Shelby, Ohio, assignor to American Machine & Foundry Company

Original No. 2,974,955, dated Mar. 14, 1961, Ser. No. 719,823, Mar. 7, 1958. Application for reissue Mar. 12, 1963, Ser. No. 266,135

Int. Cl. A63d *5/04*

U.S. Cl. 273—43 A **11 Claims**



17. In combination with a bowling pin spotting machine having first and second ball operating cycles for each discrete playing frame of a bowling game, sensing means associated with said machine for detecting the presence or absence of standing pins after each ball of said frame is rolled, first and second totalizing means each operative respectively after said first and second ball has been rolled in response to actuation of said detector elements for indicating for said discrete frame only, the actual, numerical pinfall during said first or second ball cycles respectively, means operative after said second ball has been rolled for conditioning said second totalizing means for actuation by said detecting elements, said last-named means including means for incapacitating said first totalizing means after said second ball is rolled.

27,417
DYNAMIC CONVERGENCE DEVICE FOR THREE ELECTRON GUN COLOR TELEVISION RECEIVER

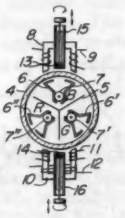
Susumu Egawa, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Original No. 3,461,341, dated Aug. 12, 1969, Ser. No. 689,551, Dec. 11, 1967. Application for reissue May 26, 1970, Ser. No. 40,748

Int. Cl. H01j *29/50, 29/70*

U.S. Cl. 315—13 C **7 Claims**

A dynamic convergence device for a three-electron-gun color television receiver, which is miniaturized and manufactured at low cost as compared with the conventional devices of this type. In the dynamic convergence device disclosed herein, a pair of convergence assemblies each comprising a core and a coil are positioned symmetrically with respect to the longitudinal axis of a picture tube, one of the convergence assemblies being associated with one of the pole pieces for said picture tube and the other convergence assembly being associated with the remaining



two pole pieces, and currents of parabolic waveform flow through said coils.

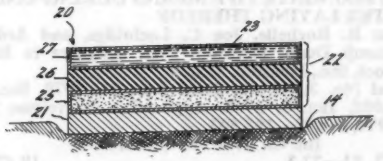
27,418
METHOD AND APPARATUS FOR IMPROVING SEISMIC IMPACT SIGNALS

William H. Mayne, San Antonio, Tex., assignor to Petty Geophysical Engineering Company, San Antonio, Tex.

Original No. 3,367,443, dated Feb. 6, 1968, Ser. No. 464,406, June 16, 1965. Application for reissue Feb. 2, 1970, Ser. No. 8,048

Int. Cl. G01v *1/14*

U.S. Cl. 181—.5 EC **11 Claims**



An impact buffer zone of special construction is provided for operation in a seismic system with a seismic impulse hammer that impacts the earth to provide a shock wave. The buffer zone, when coupled with a rigid plate on the earth, preferably has a specific thickness relationship to permit a seismic wave traverse time through the buffer zone greater than the traverse time through the rigid plate. The buffer zone may include multiple layers of elastic materials such as water, rubber, sand, oil, or foam plastic. Accordingly, means and methods are disclosed for elastically absorbing a portion of the impact of a moving mass generating seismic impulses in such a manner that seismic impulses are produced with a rise time of less than one millisecond.

27,419
CLOSURE FOR A BOTTOM POUR METALLURGICAL LADLE

John Nadrich, 9756 South Ave. 44514, and John A. Ericson, 732 Market St. 44502, both of Youngstown, Ohio

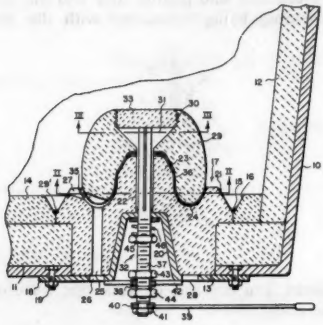
Original No. 3,386,633, dated June 4, 1968, Ser. No. 544,009, Apr. 20, 1966. Application for reissue June 5, 1970, Ser. No. 43,841

Int. Cl. B22d *37/00*

U.S. Cl. 222—548 **10 Claims**

A valve and nozzle assembly for a bottom pour metallurgical ladle which can be controlled from below the

ladle without the use of the usual refractory shield stopper rod. The nozzle has a pair of spaced concentric annular wells in its top surface with a discharge port extending downwardly from the lower surface of the inner well. The valve element is bell-shaped with its skirt portion fitted



into the inner well. The valving element is rotated by a rod extending downwardly through the nozzle on the axes of the wells and has a notch in its skirt portion which is rotated into and out of registry with the discharge port thus opening and closing the valve.

27,420

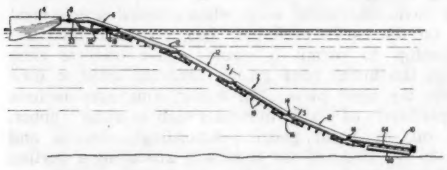
MARINE APPARATUS FOR SUPPORTING FLEXIBLE ELONGATE PIPE MEANS DURING UNDERWATER LAYING THEREOF

William R. Rochelle, Joe C. Lochridge, and Ardeshir Rustomji Desai, Houston, Tex., assignors to Brown & Root, Inc., Houston, Tex.

Original No. 3,507,126, dated Apr. 21, 1970, Ser. No. 696,005, Jan. 5, 1968. Application for reissue Nov. 3, 1971, Ser. No. 195,503

Int. Cl. B63b *5/34;* **F16l** *1/00*

U.S. Cl. 61—72.3 **18 Claims**



A marine apparatus for supporting flexible elongate pipe means during underwater laying thereof from a vessel floating on the surface of a body of water. The apparatus includes a longitudinally extending elongate ramp adapted to be secured at one end to the vessel extending away therefrom generally down into the water. The ramp includes a plurality of longitudinally spaced support members each provided with closed hollow chamber portions to provide each member with at least partial buoyancy. Means connnecting adjacent support members together includes at least one pivotal connection means positioned between at least one pair of adjacent support members for permitting relative pivotal motion therebetween about a generally horizontal pivot axis. At least one torque applying means is connected with the hinge means for applying torque thereto to selectively vary and thus rigidly or fix the relative inclination of the adjacent support members. Pipe contacting means secured to and spaced along the ramp are adapted to underlie and support the pipe means. Flooding means is connected with the support members for selectively and separately causing the passage of water between the interior and exterior of the various hollow chamber portions of the various support members so that the torque acting about the pivotal connection means may be changed to reduce the effort required to be exerted by the torque applying means.

27,421

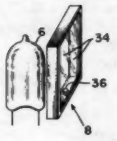
PYROTECHNIC MEANS FOR INTERRUPTING THE LIGHT OUTPUT OF A FLASH BULB

Wiley H. Owens, Bloomington, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Original No. 3,517,196, dated June 23, 1970, Ser. No. 700,998, Jan. 26, 1968. Application for reissue Sept. 24, 1970, Ser. No. 74,964

Int. Cl. G01j *1/20*

U.S. Cl. 250—201 **10 Claims**



In a photoflash system, means are provided for controlling the effective light output from a flash bulb in accordance with demand. The means include light sensing means responsive to light reflected from the object of the photo. Signals from the sensing means are integrated and used to trigger means for obfuscating the light source. The latter means may include a vaporizable substance, a deflagrating substance or the like which, in response to the trigger signal, forms an opaque shield between the light source and the photographic object.

27,422

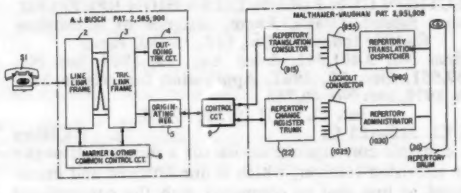
AUTOMATIC RECALL SWITCHING SYSTEM

Max S. Schoeffler, Madison Township, Middlesex County, N.J., assignor to Bell Telephone Laboratories, Incorporated, New York, N.Y.

Original No. 3,493,688, dated Feb. 3, 1970, Ser. No. 536,872, Mar. 23, 1966. Application for reissue Nov. 5, 1971, Ser. No. 196,172

Int. Cl. H04m *3/44*

U.S. Cl. 179—18 BA **9 Claims**



An arrangement is disclosed for automatically establishing a calling connection from a privileged telephone customer to a previously called station in response to an abbreviated dialed code. The called directory number dialed from the station of a privileged customer is automatically written into a designated location of a central

memory to the exclusion of any priorly written directory number. The privileged customer can initiate retrieval of the last called directory number from the designated location by dialing an abbreviated number. The directory number retrieved from the designated location is then automatically used to establish a calling connection to the station defined thereby.

27,423

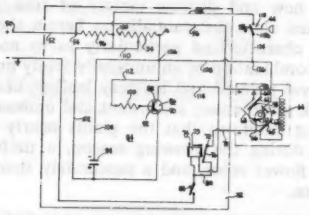
WINDSHIELD CLEANING SYSTEM FOR MOTOR VEHICLES

William C. Riester, Clarence, N.Y., assignor to Trico Products Corporation, Buffalo, N.Y.

Original No. 3,339,123, dated Aug. 29, 1967, Ser. No. 330,139, Dec. 16, 1963. Application for reissue Aug. 15, 1969, Ser. No. 853,568

Int. Cl. B60s *1/08*

U.S. Cl. 318—443 **10 Claims**



A windshield wiper control system for producing timed dwell periods between each cycle of windshield wiper operation is provided with a manually settable timing network including a transistor which controls the energization of a circuit interrupter. The circuit interrupter is connected in parallel with a cyclically actuated, motor operated parking switch. The parking switch opens to stop the wiper motor at the end of each cycle. In a preset time interval after stopping, the timing network operates to actuate the circuit interrupter thus restarting the motor. The motor remains energized through the parking switch until the next dwell period. The timing network includes a manually variable resistor which controls the discharge time of a capacitor. The transistor is triggered conductive when the capacitor is charged. The timing network is energized by a switch responsive to motor rotation.

27,424

ZINC BORATE OF LOW HYDRATION AND METHOD FOR PREPARING SAME

Nelson P. Nies, Laguna Beach, and Richard W. Hulbert, Garden Grove, Calif., assignors to United States Borax & Chemical Corporation, Los Angeles, Calif.

No Drawing. Original No. 3,549,316, dated Dec. 22, 1970, Ser. No. 648,968, June 26, 1967. Application for reissue May 18, 1971, Ser. No. 144,659

Int. Cl. C01b *25/00*

U.S. Cl. 23—59 **11 Claims**

A crystalline zinc borate having the approximate composition $2ZnO \cdot 3B_2O_3 \cdot 3.5H_2O$, and the preparation of the zinc borate. Preparation of the zinc borate is accomplished by reacting boric acid and an inorganic zinc compound in an aqueous medium at temperatures above about 70° C.

PLANT PATENTS

GRANTED JULY 4, 1972

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

3,224
CHRYSANTHEMUM PLANT (HOSTESS)

Leonard H. Shoesmith, Westfield, Woking Surrey, England, assignor to Pan-American Plant Company, Chicago, Ill.

Filed Oct. 5, 1970, Ser. No. 78,309
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—76 **1 Claim**

A new variety of greenhouse pot-plant type of chrysanthemum distinguished by the pink-purple color of its profusely produced blooms, its compact habit of growth which breaks freely with many branches, and its uniform, dependable response to protoperiod control for flowering at any preselected time of the year.

3,225
CHRYSANTHEMUM PLANT (COPPERPLATE)

Leonard H. Shoesmith, Westfield-Woking Surrey, England, assignor to Pan-American Plant Company, Chicago, Ill.

Filed Oct. 5, 1970, Ser. No. 78,310
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—79 **1 Claim**

A new variety of chrysanthemum plant of the decorative type suitable for pot-plant culture, distinguished by its good branching quality and profuse production of very distinctive generally copper colored or bronze-red blooms. This variety is a free breaker and produces short symmetrical plants that provide a brilliant display as a potted plant.

3,226
ROSE PLANT

Samuel D. McGredy IV, Portadown, Ireland, assignor to Howard Rose Company, Hemet, Calif.

Filed Oct. 8, 1970, Ser. No. 79,365
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—11 **1 Claim**

1. A new and distinct variety of rose plant of the hybrid tea class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of a bushy, upright and vigorous habit of growth, abundant and attractive foliage, a profuse blooming habit, both outdoors and in the greenhouse, high centered flowers of double form and large size, and a distinctive and attractive light red flower color.

3,227
ROSE PLANT

Louis Lens, O. L. Vrouwe Wavre, Belgium, assignor to Jackson & Perkins Company, Medford, Oreg.

Filed Oct. 8, 1970, Ser. No. 79,366
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—20 **1 Claim**

1. A new and distinct variety of rose plant of the hybrid tea class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of a moderately vigorous bush habit, leathery, non-glossy, attractive foliage, large flowers of a form similar to that of its parent "Mustang" (U.S. Plant Patent No. 2,657), an exceptionally clear, uniform and pure Vermilion flower color which lightens slightly to Dutch Vermilion as the flowers mature, and an excellent flower petal substance which produces a long-lasting effect both on the plant and as cut flowers, with the outer petals being of good quality and requiring no "cleaning" when used as cut flowers.

3,228
ROSE PLANT

Reimer Kordes, Holstein, Germany, assignor to Jackson & Perkins Company, Medford, Oreg.

Filed Dec. 28, 1970, Ser. No. 100,244
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—15 **1 Claim**

1. A new and distinct variety of rose plant of the hybrid tea class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of an unusually freely branched plant habit, oval pointed and leathery leaflets of medium size and dark green color, a constant and unusually abundant blooming habit, so that the plants nearly always have flowers during the growing season, a uniform Mimosa Yellow flower color, and a moderately strong tea flower fragrance.

3,229
ROSE PLANT

Reimer Kordes, Sparrieshoop, near Elmshorn, Holstein, Germany, assignor to Jackson & Perkins Company, Medford, Oreg.

Filed Dec. 28, 1970, Ser. No. 102,274
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—22 **1 Claim**

1. A new and distinct variety of rose plant of the floribunda class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of a bushy and compact plant habit when grown outdoors, exceptionally stiff and erect stems, an unusually vivid flower color in both the half-open and open flowers, corresponding to Capsicum Red on the upper surface of the petals and fading from Orange Buff to nearly white on the reverse of the petals, and little or no flower fragrance.

3,230
PEACH TREE

Grant Merrill, Tulare County, Calif. (416 N. Anderson Road, Exeter, Calif. 93221)

Filed Jan. 7, 1971, Ser. No. 104,821
Int. Cl. A01h *5/03*
U.S. Cl. Plt.—43 **1 Claim**

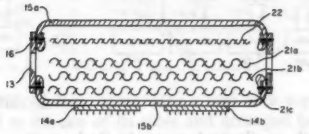
1. A new and distinct variety of peach tree substantially as illustrated and described and being characterized by a vigorously growing tree regularly bearing fruit which matures very late and has 10% to 50% of its skin surface covered with a bright red blush with an under color of bright yellow, and with firm flesh, these being good characteristics for shipping, and by bright yellow flesh with a small amount of light red around the stone, these being good characteristics for commercial freezing, and which most nearly resembles the Halloween II (U.S. Plant Pat. No. 1,472), but is an improvement on that variety by its higher skin color and its firmer and brighter yellow flesh color with less but brighter red next to the stone, thus providing better shipping and freezing qualities.

PATENTS

GRANTED JULY 4, 1972

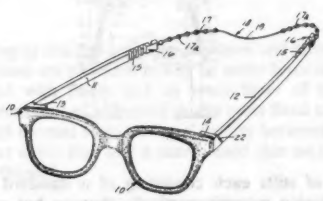
GENERAL AND MECHANICAL

3,673,609
PROTECTIVE HELMET
David N. De Simone, Philadelphia, Pa., assignor to The United States of America as represented by the Secretary of the Navy
Filed Jan. 27, 1971, Ser. No. 110,198
Int. Cl. A42b *3/00*
U.S. Cl. 2—3 R **8 Claims**



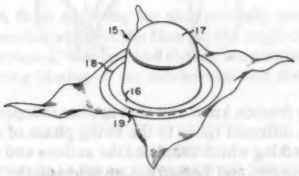
A protective helmet having pads disposed therein for distributing and cushioning the head of a wearer from impacts to the outside of the helmet. The pads are formed from spacer cloth arranged in layers having resilient properties for energy absorption of the impact, each pad having segments of nylon fastener tape attached to one side and an open weave cloth covering on the other side allowing free permeability of air. The nylon fastener tape attaches to felt strips contiguously attached within the helmet, by which the pads are mounted in the helmet, allowing for easy replacement.

3,673,610
RESILIENT HEADBAND FOR SPECTACLES
Philip J. Liautaud, Hoffman Estates, Ill., assignor to Fendall Company, Chicago, Ill.
Division of Ser. No. 776,546, Nov. 18, 1968, Pat. No. 3,582,194. This application April 5, 1971, Ser. No. 131,268
Int. Cl. G02c *3/00*
U.S. Cl. 2—14 V **6 Claims**



A resilient headband for spectacles providing light tension for retaining the spectacles on the wearer's head, comprising a length of rubberlike material having its ends of a larger diameter than the intermediate portion and arranged for securement to the spectacles whereby stretch forces applied to the headband during use result mainly in elongation of the intermediate portion.

3,673,611
MOLDED HATS HAVING IMPROVED SHAPE RETENTION AND RECOVERABILITY
James P. Cain, Spartanburg, and John H. Cross, Anderson, both of S.C., assignors to Deering Milliken Research Corporation, Spartanburg, S.C.
Continuation of Ser. No. 624,511, March 20, 1967, abandoned. This application May 18, 1970, Ser. No. 37,464
Int. Cl. A42b *1/00;* **A42c** *1/00;* **D06m** *3/00*
U.S. Cl. 2—192 **3 Claims**



A molded hat having improved shape retention and recoverability properties wherein the fabric of the crown and brim comprises a single unit eliminating the need for sewing the brim to the crown, said fabric containing a stabilizing polymeric composition. These molded hats are prepared by placing the stabilized fabric in a hat mold and thereafter applying heat and pressure to effect the desired shape. The improved shape retention and recoverability properties result from the presence of the polymeric composition in the fabric.

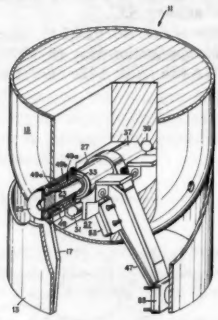
3,673,612
NON-THROMBOGENIC MATERIALS AND METHODS FOR THEIR PREPARATION
Edward W. Merrill, and Patrick Seck-Lai Wong, both of Cambridge, Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.
Continuation-in-part of Ser. No. 745,400, July 17, 1968, abandoned, Continuation-in-part of Ser. No. 747,789, July 26, 1968, abandoned. This application Aug. 28, 1970, Ser. No. 67,969
Int. Cl. A61f *1/00;* **A61m** *25/00;* **A61k** *17/18*
U.S. Cl. 3—1 **64 Claims**

Non-thrombogenic materials prepared by reacting a heparin-type anticoagulant, hydroxyl, or combinations of hydroxyl and acetal groups that are part of already synthesized macromolecules having an atomic carbon-to-oxygen ratio in excess of unity, an aldehyde and an acid catalyst. The non-thrombogenic materials can be used for implanted and extracorporeal biomedical devices and prostheses intended to be used in direct contact with blood, including tubes, valves, membrane assemblies for blood dialysis and oxygenation, anesthesia-carrying tubes, etc.

3,673,613
VARIABLE FRICTION KNEE UNIT WITH AN IMPROVED SWING PHASE CONTROL OF ARTIFICIAL LEGS

Charles C. Asbelle, Oakland; Michael F. Arrigo, Berkeley; Kenneth E. Hunting, Hayward, and Gene R. Helmuth, Castro Valley, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy

Filed April 8, 1971, Ser. No. 132,465
Int. Cl. A61f 1/04, 1/08
U.S. Cl. 3—27 10 Claims



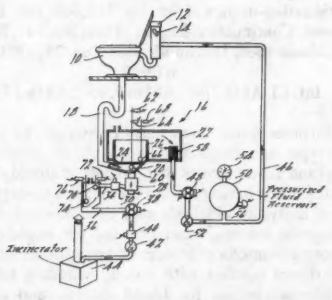
A variable friction knee unit that applies independent braking forces at different times to the swing phase of an artificial leg during walking which simulates the actions and efficiencies of the quadriceps and hamstring muscles of the thigh. Two braking modes are applied with an additional continuous braking mode. One operates at each end of swing phase. The second brake is applied a few degrees after the first brake and superimposed over the first brake. Both brakes are applied at each end of the swing phase of the walking cycle. In addition to being operative at the terminus of the swing, the two brakes are engaged at different times and are superimposed over the application of continuous friction so that the deceleration is a stepping function thereby simulating the function of the quadriceps and hamstring muscles of the thigh.

The invention described herein may be manufactured and used by or for the Government of the United States of America for governmental purposes without the payment of any royalties thereon or therefor.

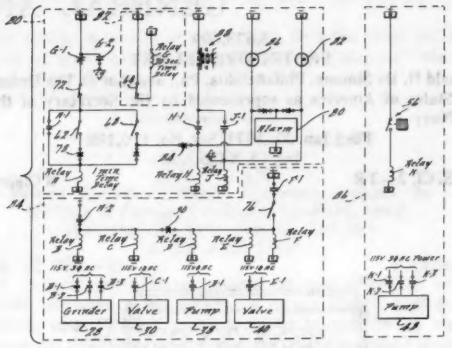
3,673,614
SEWAGE DISPOSAL SYSTEM WITH REUSABLE FLUSH MEDIUM

Robert W. Claunch, New Orleans, La., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Dec. 21, 1970, Ser. No. 99,865
Int. Cl. E03d 3/00, 5/014, 5/016, 5/10
U.S. Cl. 4—10 23 Claims



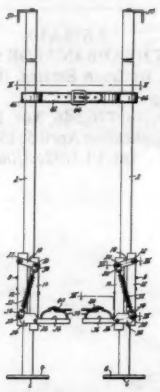
A sewage disposal system comprising a flush medium separation and distribution sub-system and a final sewage disposal sub-system. The disposal system is connected directly to existing plumbing. Sewage is transmitted from commodes and the like to a separation tank where the sewage is separated from the flush medium. A reusable flush medium replaces water to facilitate the separation process. The sewage is transferred to the final disposal sub-system and the flush medium is re-cycled for re-use.



3,673,615
BODY ATTACHED STILTS WITH VERTICALLY ADJUSTABLE STEPS

Forest M. Ellis, 2301 North 59 Street, Kansas City, Kans.

Filed April 27, 1970, Ser. No. 32,111
Int. Cl. A61f 3/00; A63b 25/00
U.S. Cl. 3—4 7 Claims



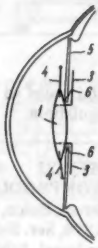
A pair of stilts each consisting of a standard having a gripping device movable vertically thereon but capable of gripping said standard to prevent movement thereof, and a step or foot rest carried by said gripping device, said gripping device being operable by a load imposed on said step by the user's weight to grip said standard, and being operable by a somewhat unnatural movement of the user's foot on the step to release its grip on the standard, whereby the elevation of the step on the standard may be changed at will during usage. In order to allow free use of a user's hands while maintaining balance a flexible waist belt is pivotally secured to a pair of small retainer loops which are freely slidable along the standards.

3,673,616

ARTIFICIAL ANTERIOR CHAMBER LENS

Svyatoslav Nikolaevich Fedorov, ulitsa Novopeschanaya, 2-a, kv. 28, and Valery Dmitrievich Zakharov, ulitsa Geroev Panfilovtsev, I, korpus 5, kv. 332, both of Moscow, U.S.S.R.

Filed Jan. 16, 1970, Ser. No. 3,459
Int. Cl. A61f *1/16, 1/24*
U.S. Cl. 3—13 3 Claims



An artificial lens, comprising a lens with supporting loops attached to on one of its sides and arranged behind the iris, and supporting rods fixed on said lens peripherally and directed radially with respect to the latter, said rods being located in front of the iris.

ERRATUM

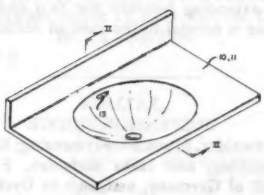
For Class 4—10 see:
Patent No. 3,673,614

3,673,617

INTEGRAL TOPS AND BOWLS FOR SINKS AND THE LIKE AND METHODS OF MAKING THE SAME

Robert D. Schulz, Jr., 1386 Cardial Drive, Pittsburgh, Pa.

Filed Sept. 16, 1969, Ser. No. 858,369
Int. Cl. E03c *1/18*
U.S. Cl. 4—187 7 Claims



An integral sink top and bowl structure and method of making the same are provided having an outer layer of rigid resin reinforced with fibers and an inner layer of substantially greater thickness of a foamed in situ resin fixed to said outer layer, said foamed resin having a density between about 5 to 20 lbs per cubic foot and a dense, hard skin on the exposed surfaces thereof.

3,673,618

FOLDING BED ARRANGEMENT

Samuel G. Wells, Whittier, Calif., assignor to Teledyne, Inc., Los Angeles, Calif.

Filed Jan. 28, 1971, Ser. No. 110,726
Int. Cl. A47c *19/00*
U.S. Cl. 5—164 6 Claims

A bed lift mechanism for easy tilting of full size beds between a horizontal sleeping position and a vertical storage position. A bed frame is pivotally mounted for rotation about a horizontal axis near an edge. A support member extends from the pivoted edge toward the center of the frame. A floor engaging link pivotally mounted on the support member engages the floor as the frame is tilted from the vertical storage

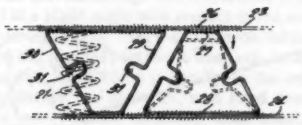
position. A floor engaging leg also pivotally mounted on the support member engages the floor as the angle of tilt from the vertical increases. The link and the leg are coupled by a leg actuator. Spring biasing of the mechanism aids the frame tilting action.

3,673,619

TRAPEZOIDAL STABILIZERS FOR INNER SPRING UNITS

John C. Kline, Merrick, and Albert F. Kronman, Locust Valley, both of N.Y., assignors to Eclipse Sleep Products, Inc., Brooklyn, N.Y.

Filed Jan. 7, 1970, Ser. No. 1,228
Int. Cl. A47c *23/00*
U.S. Cl. 5—260 5 Claims



Wire elements of generally trapezoidal shape having a variety of spring members in the non-parallel arms of the trapezoids are disclosed. The spring members are incorporated between the upper and lower edges of inner spring box springs, mattresses and the like to provide a wide variety of support to the edges. The spring members, upon the application of pressure flex inwardly or axially, permitting close spacing of individual trapezoidal elements.

3,673,620

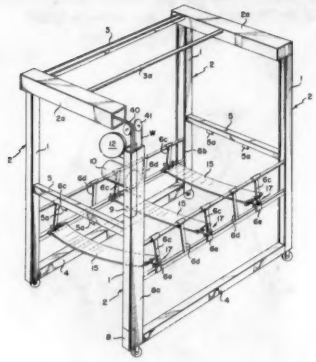
HYDRAULICALLY-OPERATED TROLLEY FOR HOSPITAL BEDS

Barbara Joan Saunders, Mill House, Cricket Hill, Yateley, near Camberley, Surrey, England

Filed Feb. 28, 1969, Ser. No. 803,238
Int. Cl. A61g *7/10;* A47c *3/32*
U.S. Cl. 5—63 6 Claims

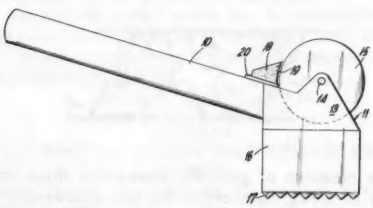
A trolley for use in conjunction with a hospital bed, the trolley comprising a pair of end frames each having one transverse vertically movable bar which carries means to attach the trolley to the bed. There being a pair of side rail frames vertically movable connected between the end frames, and having a plu-

rality of horizontally spaced webs interconnecting the side rail frames for supporting a patient. Lastly, there are hydraulic



means for selectively raising and lowering the side rail frames and the webs. Optionally, a weighing device can be used in combination with the trolley to weigh patients in situ.

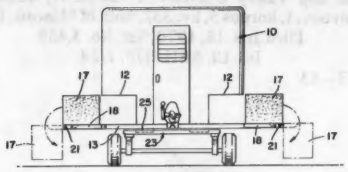
3,673,621
MULTI-PURPOSE CARPET SEAM JOINING TOOL
James Pecorella, 84-11 - 90th Street, Woodhaven, N.Y.
Filed March 3, 1971, Ser. No. 120,560
Int. Cl. B25f *1/00*
U.S. Cl. 7—8 **6 Claims**



A tool is adapted to attach the ends of carpet onto a flat strip having protruding prongs to form a joining handle and having a spindle, a roller rotatably mounted on the spindle, and a hammer head integral with the yoke. The roller levels the carpet on the strip, forces the prongs through the backing of the carpet, and the hammer flattens the prongs.

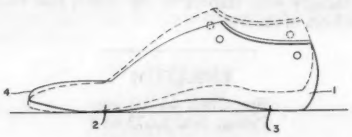
3,673,622
AMPHIBIAN CAMPER VEHICLE
Randy B. Allen, 2179 India Hook Road, Rock Hill, S.C.
Filed Dec. 4, 1970, Ser. No. 95,191
Int. Cl. B63b *35/00*
U.S. Cl. 9—1 T **6 Claims**

A camper vehicle body travels over land on a wheeled trailer bed behind any towing vehicle having suitable hitch means. To sustain the camper body in the water, the same is equipped with laterally extendable outrigger floats or pontoons. The pontoons are nestable within side notches of the



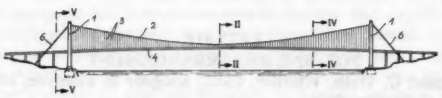
camper body during over land travel so that the caravan will not exceed highway width regulations.

3,673,623
LAST FOR SHOE PRODUCTION
Itzchak Zohar, 71 Sokoloff Street, Holon, Israel
Filed June 26, 1970, Ser. No. 50,083
Claims priority, application Israel, July 10, 1969, 32,598
Int. Cl. A43d *3/00*
U.S. Cl. 12—133 R **1 Claim**



A last for shoe production. In that last there is defined a metartasal line being the line corresponding to that line of the foot sole connecting the joints which separate the metartasus from the phalanges. The last is characterized by at least one bulge at the metatarsal line region so designed that when the last is rested on a horizontal surface the toe portion remains clear of that surface while when the last is tilted by lifting the heel portion by the height of the designated heel, the toe portion touches the surface. It is further characterized by the fact that a cord extending between the two end points of the metartasal line is normal to the median vertical plane of the last.

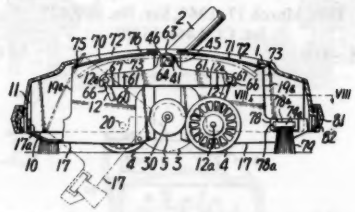
3,673,624
SUSPENSION BRIDGE
Ulrich Finsterwalder, Munich-Obermenzing; Klemens Finsterwalder, Socking, and Hahs Stefaniak, Freising-Weihenstephan, all of Germany, assignors to Dyckerhoff & Widmann Kommanditgesellschaft, Munich, Germany
Filed Aug. 18, 1970, Ser. No. 64,725
Claims priority, application Germany, Aug. 18, 1969, P 19 41 977.3; Aug. 18, 1969, P 19 41 978.4
Int. Cl. E01d *11/00*
U.S. Cl. 14—19 **7 Claims**



Wide span suspension bridge having a strengthening or reinforcing girder in the form of a streamlined solid walled box girder, which box girder is suspended by vertical trusses or supports from a supporting cable disposed in the vertical cen-

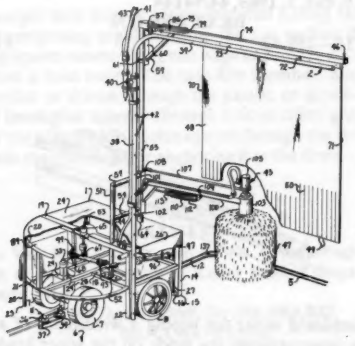
tral plane of the bridge with which supports it is articulately connected.

3,673,625
CARPET SWEEPER AUXILIARY BRUSH MEANS
Hiroshi Fukuba, 2-320-82 Matsugaoka, Nigareyama, Japan
Division of Ser. No. 823,570, May 12, 1969, Pat. No. 3,628,211. This application March 4, 1971, Ser. No. 121,013
Int. Cl. A47l *11/33*
U.S. Cl. 15—42 **3 Claims**



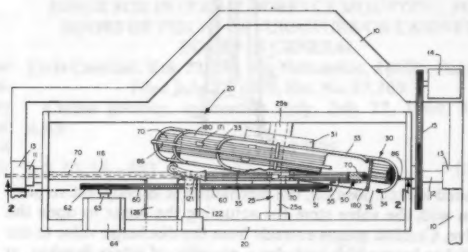
A carpet sweeper to be moved back and forth by operating a handle is provided with a rotary cleaning brush adapted to be moved in contact with the floor by means of drive wheels on a sweeper body. The frame cover of the sweeper body is of a double wall structure made of a thin, lightweight synthetic resin plate. The sweeper body further includes dust receptacles covering the under portion and positioned to the front and rear of the rotary brush, auxiliary brush means mounted on each end of the dust receptacles and means for elevating the drive wheels and comb members to clean the rotary brush. The operating members for opening or closing the dust receptacles and for elevating means are disposed on the upper surface of the frame cover.

3,673,626
VEHICLE WASH APPARATUS
Gordon V. Lieffring, 2 East Gregory Boulevard, Kansas City, Mo.
Division of Ser. No. 831,598, June 9, 1969, Pat. No. 3,581,333. This application March 15, 1971, Ser. No. 124,221
Int. Cl. B60s *3/04*
U.S. Cl. 15—97 R **6 Claims**



An automatic vehicle washing apparatus having a mobile carriage for movement along a predetermined path to wash a vehicle parked within such path. The improvement includes a standard swingably mounted on the carriage with a brush arm extending therefrom and supporting an arm with a mop frame movable thereon and supporting a depending fabric member with strips for engaging the upper surfaces of the vehicle during the washing cycle. The apparatus has controls whereby at the end of the washing cycle the standard is swung to move the brush arm and mop arm to a position trailing the carriage and away from the vehicle. The apparatus has a structure responsive to change of direction of the carriage for moving the mop arm toward but spaced from the vehicle and thereby reduce the space required for the path of the apparatus.

3,673,627
DRIVE FOR RODDING MACHINE
Charles B. Caperton, Montgomery Court Apartments, Narberth, Pa.
Continuation-in-part of Ser. No. 75,568, Sept. 25, 1970
Filed June 25, 1971, Ser. No. 156,867
Int. Cl. B08b *9/02*
U.S. Cl. 15—104.3 SN **3 Claims**

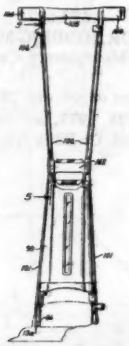


A drive for a sewer rodding machine is disclosed which includes a circular arcuate channel surface, such as the channel periphery of a wheel, around which the rod is looped. The wheel functions both as a drive wheel and as a torsion-taking wheel for preventing the twist of the twisting rod from getting back into the storage reel. The storage reel, and the drive-and-torsion-taking wheel, are supported on a fixed axle for rotation in a rotatable carriage. The fixed axle is slightly bent or angled. The storage reel is mounted on the bent or angled part of the axle so that the storage reel is rotatable in a plane which is disposed at a slight angle with respect to the axis of rotation of the carriage. The drive-and-torsion-taking wheel is mounted on the straight part of the bent axle, so that the wheel is rotatable in a plane which is parallel to the axis of the carriage. The storage reel includes, as a fixed component part thereof, an inner annular confining band which embraces a substantial portion of the channel periphery of the drive-and-torsion-taking wheel. This band functions to confine the rod in the peripheral channel of the wheel against radially outward movement. Due to the angular disposition of the annual confining band relative to the drive-and-torsion-taking wheel, openings are available for entry and exit of the rod into and out of the wheel's peripheral channel.

3,673,628
ARTICULATED HANDLE AND SHAMPOO TANK FOR A FLOOR CARE MACHINE
Paul E. Gaudry, Laval des Rapides, Quebec; Edouard Gaudry, Cite-St.-Laurent, Quebec; Raymond Descarries, Montreal, Quebec, and James Anderson, Daie-D-Durfe, Quebec, all of Canada, assignors to Consolidated Foods Corporation, Chicago, Ill.
Division of Ser. No. 798,549, Dec. 19, 1968, abandoned, which is a division of Ser. No. 647,378, June 20, 1967, abandoned. This application Oct. 16, 1970, Ser. No. 81,454
Int. Cl. A47l *11/40*
U.S. Cl. 15—143 A **1 Claim**

In accordance with the present invention there is provided a floor polisher or the like having a manipulating and carrying handle comprising a lower fork pivotally connected to the

polisher base and an upper fork pivotally connected to the lower fork, there being releasable locking means for securing the forks in extended fixed position relative to each other. A shampoo tank is removably carried by the lower fork and is provided with a discharge valve having a valve stem extending from the upper end of the tank adjacent to the pivotal joint between the forks. Valve actuating mechanism is carried by the upper fork and is so arranged that when the forks are in extended locked position, the mechanism is in cooperative position with the valve stem for actuating the latter to open the valve. Conduit means extends from the discharge valve to the polisher base which includes a plurality of rotary brushes, at least one of which has an annular recess in which the conduit discharges. Each brush has a ring of sponge material, the rings of the different brushes being in compressive contact with each other. A channel is provided between the annular recess and the sponge on that brush.



3,673,629

MAGNETIC PIPELINE PIGS

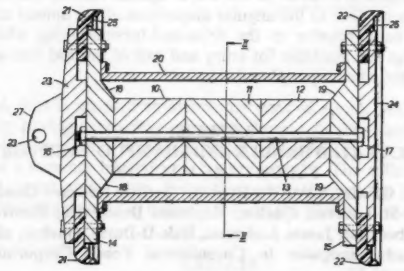
Ernest D. Casey, Alveston, and Lloyd H. Soie, Bristol, both of England, assignors to Ernest-Lloyd Limited, Bristol, England

Filed June 16, 1970, Ser. No. 46,701

Claims priority, application Great Britain, June 16, 1969, 30,474/69; Oct. 8, 1969, 49,347/69

Int. Cl. B08b *9/04*; F17d *3/02*

U.S. Cl. 15—104.06 R **7 Claims**



A pig or traveller for use in a pipeline contains a magnetic device having poles disposed close to, but out of contact with, the inside walls of the pipe so as to be capable of magnetically saturating the walls and creating a magnetic field outside the pipe which can readily be detected, e.g. by means of a sensitive magnetometer. Pole pieces in the form of radial flanges may be used with an axially extending magnet assembly. Alternatively, the magnetic device may be rotatably mounted in the pig and provided with an impeller which employs pipeline pressure to rotate the magnetic device, and so creates a rotating magnetic field, if the pig becomes stuck. By establishing detector stations at intervals along the pipeline, the progress of the pig can be monitored.

3,673,630

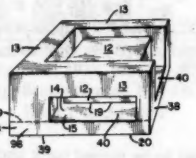
BRUSH HANDLE COMPRISING FENCELIKE PORTIONS FOR FENCING IN ITS BRISTLES, AND THE LIKE

Thomas P. O'Donnell, 220 Highland Boulevard, Kings County, N.Y.

Filed March 17, 1969, Ser. No. 809,477

Int. Cl. A46b *15/00*

U.S. Cl. 15—160 **5 Claims**



A brush handle comprising a handle portion comprising at least a bottom surface comprising at least a center portion for attaching brush bristles therewith and a surrounding border portion comprising each of opposite side portions abutting upwardly into a pair of fencelike portions sized overall for fencing-in and bordering said brush bristles and for safely fencing-in a dirty tool brushed against said brush bristles. A said fencelike portion comprises a bottom opening portion therethrough and leading to and from said brush bristles and through which said dirt can penetrate from said brush bristles and article after being brushed from said tool.

3,673,631

WINDSHIELD WIPERS FOR VEHICLES

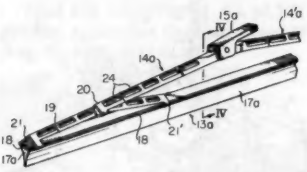
Tadaaki Yamadai, Yokosuka; Tadao Kushida, Nakagun; Hiroshi Konishi, Fujisawa, and Yoshinari Inaba, Machida, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan and Ichikoh Industries Limited, Tokyo, Japan

Filed June 18, 1970, Ser. No. 47,476

Claims priority, application Japan, June 27, 1969, 44/60375; Oct. 3, 1969, 44/94144

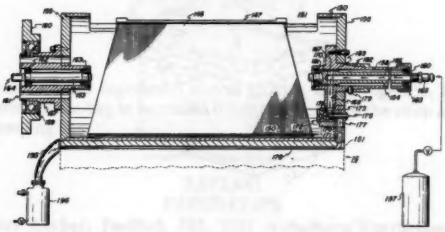
Int. Cl. B60s *1/38*

U.S. Cl. 15—250.42 **11 Claims**



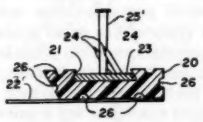
A windshield wiper for wiping a windshield of a vehicle, wherein improvements are made on the wiper blade so that the lifting force which is imparted to the wiper blade when the vehicle is driven at a high speed is significantly reduced by reducing the overall width of the wiper blade or by producing a force counteracting the lifting force through provision of a plurality of holes in the leeward side wall of each of the wiper blade supporting elements or stays each of which is configured in a shape of an inverted letter V in cross section.

3,673,632
CLEANING APPARATUS
Raymond K. Egnaczak, Williamson, N.Y., assignor to Xerox Corporation, Rochester, N.Y.
Filed Nov. 14, 1969, Ser. No. 876,715
Int. Cl. B08b 5/00
U.S. Cl. 15—316 9 Claims



A system for removing accumulations of liquid and fine solid materials from between two movable contacting members that seal the accumulated materials in a slot where they are blasted by air to a receptacle. The blast is timed to occur when the slot is sealed between the member which carries it and a second member moving over it. An actuator releases air when the slot is sealed.

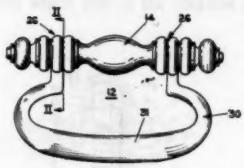
3,673,633
CARPET TACK STRIP
James Frebraro, 540 Idlewood Road, Pittsburgh, Pa.
Filed Sept. 23, 1969, Ser. No. 860,323
Int. Cl. A47g 27/04
U.S. Cl. 16—16 4 Claims



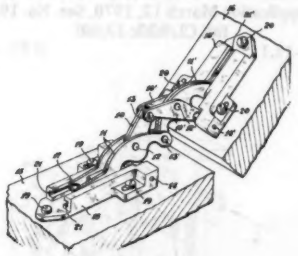
A carpet tack strip of plastic material having tack-like elements projecting angularly from the top surface thereof and having spacer means along one edge to provide accurate spacing from a base board. The tack-like members may be either embedded or driven through the plastic or struck-up from a metal insert that extends through a dove-tailed groove on the top of the plastic strip. Holes extend through the strip for driving nails therethrough for anchoring it to the floor.

3,673,634
DRAWER PULL
Edwin Van Ryn, Walker, and Edwin V. Driesenga, Holland, both of Mich., assignors to Keeler Brass Company, Grand Rapids, Mich.
Filed Dec. 4, 1969, Ser. No. 882,042
Int. Cl. A47b 95/02
U.S. Cl. 16—126 10 Claims

An improved drawer pull and method of assembly, the pull utilizing a support having rearwardly-mounted, axially-extending ears which cam against a cut-away portion of the bail of the pull so as to cause the support to pivot during assembly into coaxial alignment with the bail with the axle of the bail mounted in a bearing slot in the support. The ears and the extremities of the cut-away portion serve to limit the possible rotation of the bail on the support once the support is attached by screws to the drawer. The bail axle and the support bearing slot can be either short so as to require two of each, or the axle and slot can extend across the full length of the support.



3,673,635
HINGE FOR INTERNAL SURFACE MOUNTING, FOR DOORS OF PIECES OF FURNITURE OR CABINET DOORS IN GENERAL
Livio Cencioni, Km. 21.750, Via Nettunense, Aprilia, Italy
Filed July 22, 1970, Ser. No. 57,169
Claims priority, application Italy, July 22, 1969, 38867 A/69
Int. Cl. E05d 3/06
U.S. Cl. 16—163 3 Claims

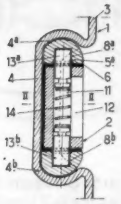


A hinge for internal surface mounting, characterized in that comprises two pairs of levers crossing each other, and in particular that each lever of the first pair is pivoted together with the corresponding lever of the second pair, and moreover, the two converging ends of the levers which constitute the first pair are articulated each other, as also articulated each other, as also articulated each other are the two converging ends of the levers constituting the second pair, so as to constitute an articulated parallelogram, whereas the other two ends (diverging) of the first pair of levers are articulated the first on the fixed part of the cabinet and the other on the door, and the (diverging) ends of the second pair of levers are articulated each in a sliding way, the first with respect to the fixed part of the cabinet and the other with respect to the door.

3,673,636
HINGE THAT TAKES TO PIECES
Jose Antonio Ruiz, 75, rue des Chantiers, Le Havre Graville, France
Filed Oct. 16, 1969, Ser. No. 866,952
Claims priority, application France, Oct. 18, 1968, 68170551
Int. Cl. E05d 1/06
U.S. Cl. 16—175 11 Claims

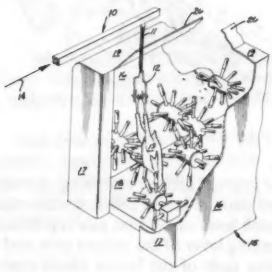
A hinge that takes to pieces for doors, cupboards, etc., comprising a male and a female part which slide around an axis. This hinge comprises two retractable pivots, each of which

can be inserted into a corresponding housing in the female part. The female part comprises a cavity whose two extremities terminate in two portions of a sphere into which are



lodged the stops comprising a housing for the retractable, interdependent pivots in the male part. The pivots are separated axially by a compression spring which holds them in position in the housing provided by the two stops.

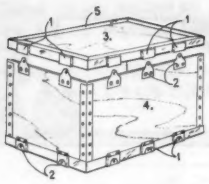
3,673,637
POULTRY PICKER
Edward J. Crane, Ottumwa, Iowa, assignor to International Agri-Systems, Inc., Ottumwa, Iowa
Continuation of Ser. No. 631,989, April 19, 1967, abandoned. This application March 12, 1970, Ser. No. 19,075
Int. Cl. A22c *21/02*
U.S. Cl. 17—11.1 **16 Claims**



A poultry picker having an overhead conveyor from which the poultry to be plucked are adapted to be flexibly suspended and carried through the machine. Positioned to either side of the path of travel of the poultry through the apparatus are a plurality of bullet-shaped, flexible finger supports. Each of the supports are rotatable about axes oriented generally toward the path of travel of the bird. The supports are arranged in upper and lower rows on each side of the machine with noncoinciding axes of rotation permitting sections of the bird to swing laterally after being engaged by the fingers on any particular support.

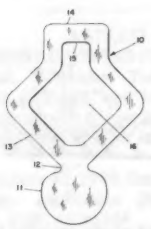
The individual supports are easily removable for cleaning and finger replacement by means of a depressible knob or button slidably and resiliently retained within the particular support hub. The support slides onto the hub and the knob extends to protrude through a suitable aperture therein. By depressing the knob, the support may be removed easily from the hub. It is understood that this abstract is not to be utilized to limit the scope of this invention.

3,673,638
DEVICE IN FOLDABLE ENCLOSURES
Hans Elov Nordgren, Ovanaker, 82800, Edbyn, Sweden
Filed Jan. 15, 1971, Ser. No. 106,722
Claims priority, application Sweden, Jan. 19, 1970, 569/70; March 20, 1970, 3825/70
Int. Cl. E05d *5/02;* **B65d** *9/12*
U.S. Cl. 24—19 **10 Claims**



This disclosure relates to a locking device for foldable enclosures to interlock parts thereof together, at least one part of the enclosure being provided with female members and another part being provided with male members which interlock with the female members, and at least one set of the members being carried by a band which has integrally struck therefrom tabs which are of a self-reinforced construction for ease of penetrating relatively hard fibrous material including wood.

3,673,639
LAUNDERING CLASP
Rosemary F. Driscoll, New Richmond, Wis.
Filed Dec. 29, 1970, Ser. No. 102,408
Int. Cl. A44b *21/00;* **B65d** *63/00*
U.S. Cl. 24—16 PB **1 Claim**

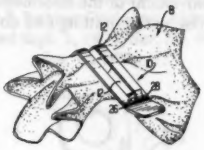


A clasping device for preventing a pair of clothing articles such as stockings, socks, mittens and the like from becoming separated during laundering. A flat strip of flexible and resilient material having a head portion, a narrower neck portion, a body portion connected to the head portion by the neck portion and having an opening sufficiently large to admit the head portion, and an end portion having a slot extending from the body opening large enough to receive the neck portion but small enough to prevent passage therethrough of the head portion.

3,673,640
BAG CLOSURE
Dwight C. Brown, 414 North Granada Street, Arlington, Va.
Filed Jan. 13, 1971, Ser. No. 106,024
Int. Cl. B65d *77/10;* **A44b** *21/00*
U.S. Cl. 24—30.5 R **9 Claims**

A closure for sealing the mouth of a bag including a bowed strap and a clamping bar struck from the interior thereof and hinged at one end to the strap. Striking the clamping bar from the interior of the strap leaves an elongated slot in the strap defined by a plurality of contiguous edges. A hook is provided

on the other end of the clamping bar which can be snapped over an edge of the slot in the strap with one hand to lock the

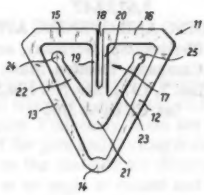


strap and bar together. Prior to locking them together, the mouth of the bag to be sealed is inserted between the strap and clamping bar.

3,673,641
PAPER-CLIPS

Kurt Lorber, Postfach 100, 7301 Aichelberg/Wurttemberg, Germany

Filed July 19, 1971, Ser. No. 163,806
Claims priority, application Germany, July 29, 1970, P 20 37 708.6
Int. Cl. B42f *1/10*
U.S. Cl. 24—67.9 **8 Claims**



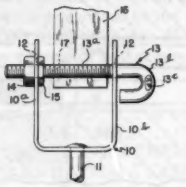
The present invention discloses and claims a paper-clip which is injection moulded in one piece from resilient plastics material. The clip has outer clamping limbs and an inner clamping member which lie in substantially the same plane when in an unstressed state, the inner clamping member comprising two clamping portions which are interconnected at one end by a connecting portion which is resistant to bending, the clamping portions having a low resistance to torsion and having smaller cross section than bridge portions which extend transversely, one from each of the other adjacent ends of the clamping portions, the ends of the transverse bridge portions remote from each other being interconnected by the outer clamping limbs which extend around the inner clamping member, the inner clamping member having, contiguous to its end remote from the transverse bridge portions, a support member which lies substantially in the plane of the inner clamping member and which extends into the vicinity of the transverse bridge portions, the transverse bridge portions being resistant to bending and the support member together with the connecting portion forming a unit which is resistant to bending in its central region and less resistant to bending in its outer regions.

3,673,642
TENSION DEVICE FOR WIRES, STRAPS, AND THE LIKE

Earnest W. Harwell, Airport Road, Mansfield, Ohio

Filed Oct. 30, 1970, Ser. No. 85,349
Int. Cl. B65d *63/00*
U.S. Cl. 24—68 D **3 Claims**

A tensioning device for flexible wires, straps, and the like utilizes a U-shape yoke having parallel legs through which passes a straight portion of a cylindrical rod about which the flexible wire or strap is wound by rotation of the rod to provide the desired tension. One end of the rod is threaded and provided with a securing nut on the outside of the associated yoke leg and a lock nut on the inside of the same leg for controlling the endwise movement of the straight portion of the rod relative to the yoke. The other end of the rod is provided with a bent portion which aids in the rotation of the rod to

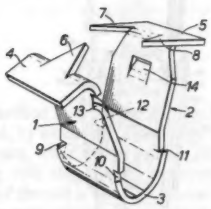


wind up the flexible member thereon and which is interengaged with a part of the associated yoke leg to hold the rod against unwinding action after the desired tension has been attained. The nuts at the other end of the rod hold this locking position.

3,673,643
HEAT SEAL RETAINING CLIPS

Colin David Kindell, Bushey, England, assignor to AMP Incorporated, Harrisburg, Pa.

Filed Oct. 26, 1970, Ser. No. 84,008
Claims priority, application Great Britain, Nov. 19, 1969, 56,565/69
Int. Cl. A44b *21/00*
U.S. Cl. 24—73 B **7 Claims**



A fastener, for reception in a hole in a panel to secure a sealing strip to the panel, comprises a generally U-shaped member of spring metal, the member having a pair of arms which extend away from a bight portion of the member, the free end of the arms being formed with outwardly extending ears and with inwardly extending teeth to grip a sealing strip.

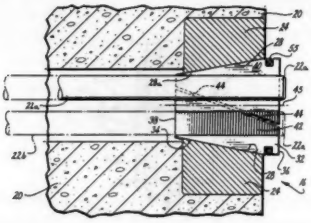
3,673,644
TENDON ANCHORAGE

George H. Howlett, Oakland, and James W. Howlett, Richmond Annex, both of Calif., assignors to Howlett Machine Works

Continuation-in-part of Ser. No. 751,951, Aug. 12, 1968, Pat. No. 3,520,032. This application July 10, 1970, Ser. No. 53,787. The portion of the term of this patent subsequent to July 13, 1987, has been disclaimed.
Int. Cl. F16g *11/00*
U.S. Cl. 24—122.6 **6 Claims**

A tendon anchorage, primarily for use in pre-tensioning and post-tensioning concrete, in which the anchorage includes an axially convergent bore and a tendon gripping wedge assembly disposed in the bore. The wedge assembly preferably includes two wedges in which interiorly located gripping portions for engaging the tendons are formed. The gripping portions may

be aligned along opposed internal faces of the wedges. One or more slots or grooves, which may be angularly skewed to the longitudinal axis of the wedge assembly, extend from the gripping portions toward or through to the peripheral wall of

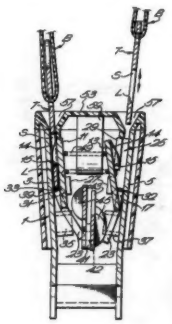


the wedges over a portion of the axial length to provide relatively movably wedge segments adjacent the gripping portions which afford the desired wedge assembly flexure and the addition of gripping forces.

3,673,645
SAFETY BELT ANCHORAGE

David William Burleigh, Yately, England, assignor to Britax (London) Limited, Byfleet, Surrey, England

Filed June 4, 1970, Ser. No. 43,439
Int. Cl. A44b *11/26*
U.S. Cl. 24—203 **13 Claims**



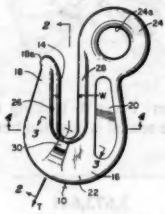
A double anchorage for securing a pair of safety straps, said anchorage being adapted to be secured to a vehicle frame or to an equivilently strong support point between a pair of adjacent passenger seats, said anchorage comprising a pair of latch plates pivotally mounted within a single housing, means biasing said latch plates apart and towards respective side walls of the housing, the face of each latch plate facing a housing side wall being provided with a latching surface adapted to engage with a belt tongue when the latter is inserted between the latch plate and the respective side wall of the housing.

3,673,646
CHAIN HOOK

Stig Svensson, Ramnas, Sweden, assignor to Ramnas Bruks Aktiebolag, Ramnas, Sweden

Filed Dec. 9, 1970, Ser. No. 96,342
Int. Cl. A43c *11/08*
U.S. Cl. 24—230.5 CR **5 Claims**

A chain hook adapted to be detachably connected to an intermediate link in a chain between a pair of adjoining links connected thereto. The hook comprises a body having a lower bight and a pair of spaced-apart, upstanding legs defining a throat open at the upper end for receiving the intermediate link of the chain on a plane generally transverse of the body of the hook. The legs include spaced-apart stop surfaces on opposite sides which are engageable with said adjoining links for limiting transverse movement of the intermediate link once it is engaged in the throat, yet permitting free downward pivotal

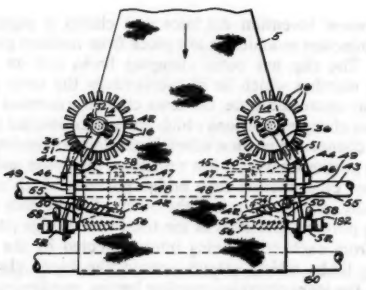


movement of one of said adjoining links toward the bight portion when pull is exerted on the chain. The body is provided with link support means extending transversely outwardly of said bight from at least one side thereof beyond said stop surfaces for supporting said intermediate link outwardly of said stop surfaces to reduce stress thereon.

3,673,647
SHEET GUIDING AND OPENING APPARATUS

Klaus Koster, Am Pferdekamp, Germany, assignor to Mount Hope Machinery Company, Taunton, Mass.

Filed Jan. 7, 1971, Ser. No. 104,577
Int. Cl. D06c *3/06*
U.S. Cl. 26—54 **10 Claims**

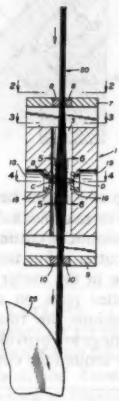


Apparatus for opening and uncurling sheet or web material, and for guiding the material along a given path, includes first and second pairs of rotatable selvage uncurlers arranged in serial order. The uncurlers of each pair engage opposite edges of the material. The lateral pull exerted by each uncurler is controlled by position sensors at either edge of the material. These are connected to react to an outward lateral shift of a first edge of the sheet by reducing the lateral pull applied to it by one of the first pair of uncurlers, and also by increasing the lateral pull on the other edge of the sheet by one of the second pair of uncurlers. This causes an inward lateral shift of the first edge that produces opposite results, increasing the pull of the first-mentioned uncurler and decreasing the pull of the second. The two remaining uncurlers are similarly affected by lateral shifts of the second edge of the material. The apparatus guides the material with a quickly responsive continuous hunting action, while opening and uncurling the material into a flat form.

3,673,648
NO-TWIST ENTANGLEMENT OF FILAMENT AND APPARATUS THEREFOR

Bernard L. Thacker, Jr., Hopewell, Va., assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Sept. 1, 1970, Ser. No. 68,687
Int. Cl. D02g *1/16*
U.S. Cl. 28—1.4 4 Claims

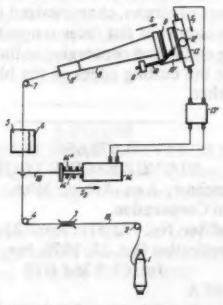


A bundle of untangled filaments is passed through a confining passageway in which it is subjected to a number of air jets to entangle the yarn. Preferably, there are four air jets, three jets on one side of the yarn and the fourth on the opposite side. Usually two jets on the one side are directed perpendicularly to the yarn path at an angle to spread and entangle the yarn, and the single jet on the opposite side is directed perpendicularly against the bundle, slightly offset from where the two air jets contact it. These jets spread and impart a twist factor to the yarn filaments about the bundle axis and thereby impart some entanglement to the yarn. The fourth jet is directed countercurrently to the flow of the yarn and further separates and entangles it.

3,673,649
YARN FEED CONTROL MEANS

Jiri Havlas; Premsyl Kostelecky, and Jaroslav Sedlarik, all of Liberec, Czechoslovakia, assignors to Elitex Zavody textilniho strojirenstvi generalni reditelstvi, Liberec, Czechoslovakia

Filed Jan. 13, 1970, Ser. No. 2,571
Claims priority, application Czechoslovakia, Jan. 20, 1969, 338-69
Int. Cl. D02q *1/12*
U.S. Cl. 28—1.7 6 Claims



Apparatus for automatically controlling the feeding of yarn into yarn supply magazines whereby to form a sufficient yarn supply in the yarn magazine for knotting together the two yarn ends, upon their breakage, without stopping the machine. The apparatus of the invention employs an adjustable sensor mounted upon the magazine, means for feeding yarn into the yarn supply magazine and means responsive to the sensor for feeding yarn into the magazine upon the attainment of a predetermined desired volume of yarn in the magazine. The apparatus of the invention responds to the completion of the filling of the yarn supply in the magazine, as well as responding to fluctuations of the volume of said supply, with a minimum delay.

3,673,650
METHOD FOR PRODUCING A THERMOPLASTIC SYNTHETIC YARN HAVING A LATENT CRIMP

Giacomo Cerutti, Gozzano, Italy, assignor to Bemberg S.p.A., Milan, Italy

Filed April 29, 1970, Ser. No. 32,796
Claims priority, application Italy, May 19, 1969, 16977A/69
Int. Cl. B29c *17/02*; D01d *5/22*
U.S. Cl. 28—72.1 4 Claims

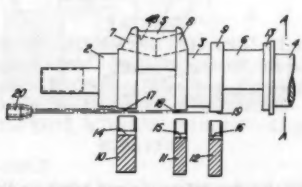
A drawing method and device for thermoplastic synthetic yarn is disclosed, by which simultaneously a latent crimp is imparted to the yarn, wherein the yarn is drawn by means of a heated drawing roll, the contact between the yarn and the heated surface of the roll is not continuous.

The invention contemplates also the yarn thus obtained and the textile articles made by the yarns as above referred.

3,673,651
CRANKSHAFT BALANCE WEIGHTS AND METHOD OF ASSEMBLY

William F. Stewart, Peterborough, England, assignor to Perkins Engines Limited, Peterborough, England

Filed April 9, 1970, Ser. No. 26,922
Claims priority, application Great Britain, April 25, 1969, 21,147/69
Int. Cl. B21k *1/08*
U.S. Cl. 29—6 6 Claims



A crankshaft is formed with stub web portions for attachment of balance weights. The crankshaft bearing surfaces

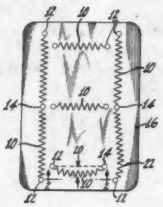
are ground and then the weights are electron beam welded to the web portions, which have a stepped configuration to enable indexing for sequential weight welding. After hardening trimmer plates are fastened to the weights axially of the crankshaft to complete the balancing. This provides an inexpensive, easily machined, accurately balanced crankshaft.

3,673,652

FILAMENTARY DISPLAY DEVICES

Richard Arthur Bonnette, New Providence, N.J., assignor to RCA Corporation

Filed May 26, 1970, Ser. No. 40,659
Int. Cl. H01j *9/18, 9/36*
U.S. Cl. 29—25.16 **8 Claims**



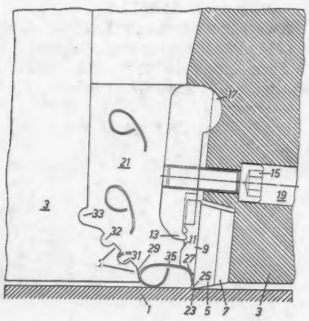
In the mounting of filamentary coils between support terminals, the coils are stretched an amount in the range of 30–120 percent of the original length thereof. After mounting, but prior to the final sealing-in of the devices, the coils are heated to a temperature well in excess of the normal coil operating temperature. The coils are then restretched. After the sealing-in of the devices, the coils are again heated to a temperature well in excess of the normal coil operating temperature.

3,673,653

CHIP DEFORMER AND BREAKER FOR USE WITH METAL CUTTING TOOL

Alfred Kaser, Rieden/Baden, Switzerland, assignor to Aktiengesellschaft Brown, Boveri & Cie, Baden, Switzerland

Filed May 13, 1970, Ser. No. 36,984
Claims priority, application Switzerland, June 3, 1969, 8394/69
Int. Cl. B26d *1/00*
U.S. Cl. 29—96 **5 Claims**



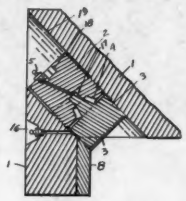
A chip breaker for deforming and breaking chips cut by a metal tool includes at least one deflecting surface for the chips constituted by a series of plane surface elements and which may also include at least one curved surface element.

3,673,654

CUTTING HEAD FOR A CHAMFERING TOOL

Frank G. Rick, 114 Gilfillan Street, Franklin, Pa.

Filed June 18, 1970, Ser. No. 47,191
Int. Cl. B26d *1/00*
U.S. Cl. 29—97 **4 Claims**



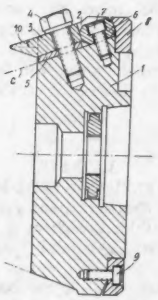
A cutter bit made up of a cutter head block, a fixed cutter and a rotary cutter bit in said block. The fixed cutter is provided to do a limited amount of cutting along the side edge of a plate and the rotary cutter is free to rotate in the hollow in a cylindrical hollow bore in the cutter head block. The inner end of the rotary cutter rests on a thrust bearing and a threaded member positions the rotary cutter in the bore. Suitable lubrication fittings are provided to supply lubricant to the inside of the hollow around the cutter.

3,673,655

MILLING CUTTERS WITH DETACHABLE BLADES

Marius Eydieux, Billancourt, France, assignor to Regie Nationale des Usines Renault, Billancourt, France

Filed May 18, 1970, Ser. No. 38,361
Int. Cl. B26d *1/12*
U.S. Cl. 29—105 **4 Claims**



Front milling cutter of the detachable blade type comprising blade inserts fitted in peripheral notches of a cutter body and secured by means of screws, characterized in that the bottoms of said notches consist of flat faces tangent to a cone coaxial with the milling cutter and converging in the forward direction thereof, so that the cutting edges of the blades are relatively close to each other.

3,673,656

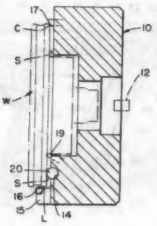
PLUNGE FACING TOOL

Wilbur R. Gerchow, Ann Arbor, Mich., assignor to Buhr Machine Tool Corporation

Continuation of Ser. No. 723,518, April 23, 1968, abandoned. This application Oct. 12, 1970, Ser. No. 80,218
Int. Cl. B26d *1/12*
U.S. Cl. 29—105 A **7 Claims**

The tool has a cutter holding head which may be rotatively engaged with or by a coaxial workpiece, the head removably

and replaceably mounting on an axial face thereof a multiplicity of known type circular cutting inserts. These cutters are circumferentially spaced from one another about the axis of the tool, and they are also spaced or staggered slightly relative to one another in the radial sense, so that upon relative rotation of the tool and work in removing material from the latter, the cutters sweep shallow circular groove paths which radially overlap one another.

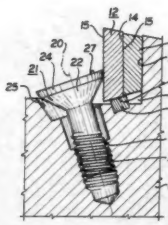


3,673,657

DEVICE FOR CLAMPING A CUTTING INSERT TO A SEAT OF A TOOLHOLDER BODY

Manfred Wallace Gustafson, and Torsten Sandrud, both of Fagersta, Sweden, assignors to Fagersta Bruks Aktiebolag, Fagersta, Sweden

Filed Nov. 14, 1969, Ser. No. 876,896
Claims priority, application Sweden, Nov. 22, 1968, 15,944/68; Nov. 22, 1968, 15945/68
Int. Cl. B26d *1/12*
U.S. Cl. 29—105 **4 Claims**



A device for clamping a cutting insert to a seat of a toolholder body, said seat having a supporting and a pair of transversely oriented holding surfaces against which the insert is firmly wedged during the threaded engagement of a clamp screw in an inclined threaded opening in the toolholder seat. The inclination of the threaded opening is such as to produce the desired wedging effect against one holding surface during rotative or tightening manipulation of the screw, while said rotative screw movement produces the wedging effect against the other transverse holding surface.

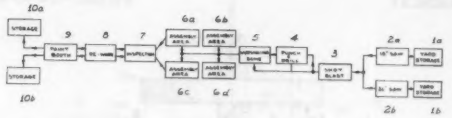
3,673,658

STRUCTURAL STEEL CONVEYOR LINE

William Dobson Hagen, Beaconsfield, Quebec, Canada, assignor to Dominion Bridge Company Limited, Montreal, Quebec, Canada

Filed Feb. 1, 1971, Ser. No. 111,489
Claims priority, application Canada, Dec. 29, 1970, 101665
Int. Cl. B23p *17/00, 19/00*
U.S. Cl. 29—155 R **17 Claims**

A production line for the fabrication of structural steel members including a storage area from which selected material is delivered to a selected conveyor of a pair by side transfer apparatus, adjustable gauge means alongside the conveyor for locating the material with respect to cutting apparatus for cutting the material to length on the conveyor, side transfer means for transferring the cut-to-length material from its conveyor to an intermediate conveyor, advancing the material on the intermediate conveyor through a shot blast zone, transferring selected material to another conveyor by side transfer means and advancing the selected material through a punch and drill unit, and advancing all of the material on the conveyors to a marshalling zone where all pertinent material and instructions are placed on the members before further advance and side traverse into selected work areas for final assembly of the material to form the structural steel members.

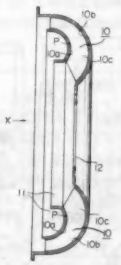


3,673,659

METHOD FOR BONDING VANES IN TORQUE CONVERTER

Hirozi Ishii, and Koichi Okamoto, both of Fuji, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Nov. 6, 1969, Ser. No. 874,477
Claims priority, application Japan, Nov. 16, 1968, 43/83530
Int. Cl. B21k *3/04*; B23p *15/02, 15/04*
U.S. Cl. 29—156.8 CF **2 Claims**



A method for bonding vanes to the impeller or turbine of a torque converter wherein the vanes are pressed to have their inner and outer flanges extending in the same direction and its blade web warped or curved in cross section, spot-welded to the core structure, snapped into the shell structure complete with the core structure, and then heated together with flux material to have the joint connections welded together at a temperature higher than the melting point of the flux material.

3,673,660

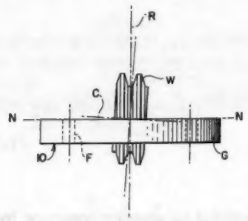
METHOD OF PRODUCING INTERNAL GEARING

Joseph J. Osplack, 14001 Piedmont, Detroit, Mich., and Rodman J. Osplack, 27425 Skye Drive West, Farmington, Mich.

Filed Nov. 13, 1969, Ser. No. 876,368
Int. Cl. B21d *53/28*; B21h *5/00*; B21k *1/30*; B23p *15/14*; B29d *15/00*
U.S. Cl. 29—159.2 **10 Claims**

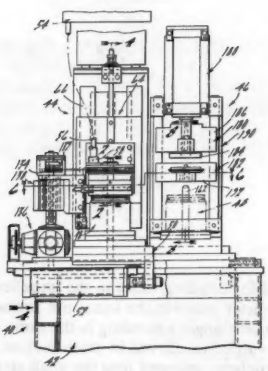
The method of producing internal spur gears, internal helical gears, tapered internal spur gears, and tapered internal helical gears consists of employing a machining or stock removing tool having an effective transverse rack cross sec-

tion composed of a basic or modified rack section of a width restricted to that required to produce the finished tooth profile without destroying the tooth profile of gear teeth adjacent to or spaced from gear teeth being cut, which machining or stock removing tool generates the tooth profile of the



internal gear being cut with which the generating tool is operatively engaged while machining such an internal gear by timed translational displacement, the effective transverse rack cross section being the apparent rack envelope of the generating tool in the transverse plane cross section of said gear.

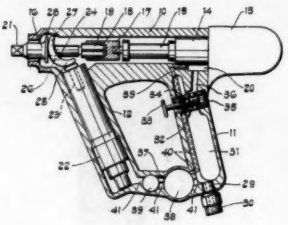
3,673,661
ROLLER BEARING ASSEMBLY FIXTURE
Kenneth Secunda, Detroit, Mich., assignor to Federal-Mogul Corporation, Southfield, Mich.
Filed Sept. 29, 1970, Ser. No. 76,530
Int. Cl. B23p *19/04*
U.S. Cl. 29—201 **27 Claims**



Apparatus for assembling rollers into pockets in a split retainer and in assembly with a double shouldered race member.

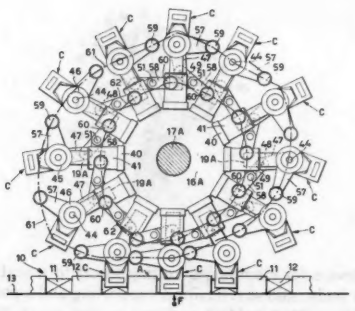
3,673,662
APPARATUS FOR TIGHTENING AND LOCKING A NUT ON A BOLT
John Hilton Turnbull, Stourport on Severn, England, assignor to G.K.N. Screws & Fasteners Limited, Warley, England
Filed Aug. 12, 1970, Ser. No. 53,080
Int. Cl. B23p *19/00*; B23d *19/04*
U.S. Cl. 29—200 B **6 Claims**

Apparatus for tightening a nut on a bolt comprising a body, a nut engaging wrench member rotatably and slidably mounted in the body, a pneumatic motor in the body to rotate the wrench member and a pneumatically operated vibratory impact device provided in the body and adapted to apply impacts to a deforming tool associated with the socket so that the



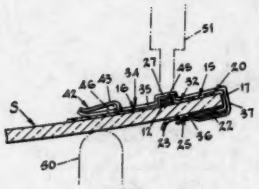
deforming tool acts on the nut and displaces parts of the thread of the nut into locking engagement with the thread of the bolt.

3,673,663
MACHINE FOR APPLYING POURING SPOUTS TO CONTAINERS
Carlo Taddei, Padenghe Sul Garda (Brescia), Italy, assignor to Seal Spout Europe S.p.a., Castiglione Delle Stiviere, Italy
Filed Dec. 11, 1970, Ser. No. 97,173
Int. Cl. B23p *19/04*
U.S. Cl. 29—200 A **8 Claims**



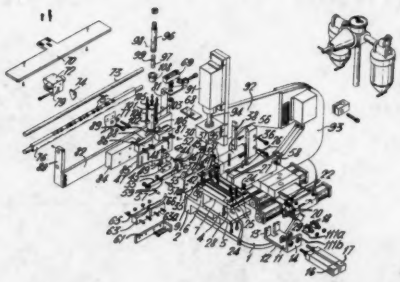
A mechanism is disclosed for applying a pouring spout to a container, such as, for example, the collapsible hopper-like metal spouts to cartons of sugar, rice or also liquid materials. The subject mechanism comprises a body which can be rotated about a vertical axis, a plurality of slidable members which can be reciprocated within said body, a conveyor mechanism for conveying and applying already formed pouring spouts, the individual assemblies of said conveying mechanism being universally connected to the slidable members aforesaid, a cam member affixed to the machine frame for guiding the individual assemblies along a preselected path. Means are also provided which are active when the assemblies travel along their preselected path, as guided by the cam members, for applying a pouring spout to a container. Anvil and hammer members are provided for clinching fastening pricks of the spouts after that they have been applied to the respective container.

3,673,664
LOCATING DEVICE
William F. Niese, Toledo, Ohio, assignor to Libbey-Owens-Ford Company, Toledo, Ohio
Filed May 6, 1970, Ser. No. 35,024
Int. Cl. B23p *19/04, 3/20;* B23k *37/04*
U.S. Cl. 29—203 P 3 Claims



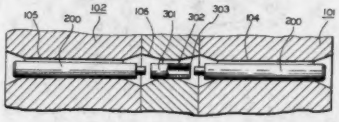
A relatively inexpensive locating device by which electric connector elements or bus bars can be attached to electrode on a glass sheet. Specifically, such locating devices can be employed to advantage during the location and soldering of the connector elements along the opposite sides of the glass sheet to conduct electrical energy to a plurality of fine metal lines fused to the glass and serving to heat the same.

3,673,665
STAKING MACHINE
Colin David Kindell, 22 Forest Walk, Bushey, and Terence Robert Raynor, 15 Russell Road, London, both of England
Filed May 21, 1970, Ser. No. 39,409
Claims priority, application Great Britain, June 17, 1969, 30,724/69
Int. Cl. H01r *43/04*
U.S. Cl. 29—203 D 5 Claims



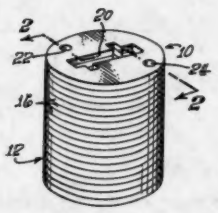
A machine is disclosed for staking terminal pins to a printed circuit board in which two strips of terminal pins are fed alternately towards a shear anvil along separate paths. The leading terminal pin of each strip is received within one of a pair of spaced channels in a shear anvil positioned adjacent a shear block. The shear anvil is arranged to move between a first position in which one channel is in alignment with a terminal pin feed path while the second channel is in alignment with a staker and a second position in which the one channel is in alignment with the staker and the second channel is in alignment with a terminal feed path. Movement of a channel from a position in alignment with a feed path to a position in alignment with the staker causes a terminal pin in the channel to be sheared from the strip.

3,673,666
APPARATUS FOR ASSEMBLING AND SECURING ELECTRICAL COMPONENTS BY DIE COMPACTING
Shiro Hozumi, Sakai; Kenichi Hirai, Osaka; Yoshiyuki Tanigawa, Neyagawa; Katuro Yoshida, Osaka, and Kanji Sugihara, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Aug. 19, 1970, Ser. No. 65,020
Int. Cl. H01r *43/04*
U.S. Cl. 29—203 DT 7 Claims



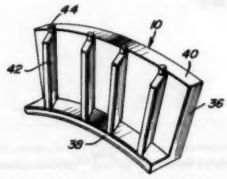
Apparatus for assembling and die compacting electric components having coaxial leads. A pair of lead magazines is provided having a plurality of tubular pins provided with terminal leads inserted into holes formed therein. A pellet magazine which is adapted to have a plurality of pellets inserted into a plurality of holes formed therein is sandwiched between the lead magazines to form a combined magazine. Transfer means transfers the combined magazine to a loading position adjacent, at least one die frame in which a plurality of die-holes are formed and in which heating means is provided. Loading means loads said plurality pellets and leads from said combined magazine into said die blank. Pressing means presses the heated pellets in said die-holes through said pins independently of each other to compact them. Unloading means then uploads the components formed within said die frame from said die frame into an empty combined magazine. With this system batches of hundreds of pellets of raw material for the electric components can be formed into intimate and integral bodies, each of which has coaxial terminal leads embedded in the ends thereof.

3,673,667
METHOD FOR PRODUCING COMPLEX SHAPES BY FILLED BILLET EXTRUSION
Paul Loewenstein, Lincoln, and Thomas A. Gorecki, Stow, both of Mass., assignors to Whittaker Corporation
Filed Nov. 23, 1970, Ser. No. 91,663
Int. Cl. B23p *17/00*
U.S. Cl. 29—423 8 Claims



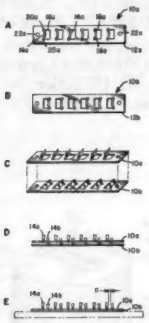
The method of this disclosure comprises the production of solid complex shapes of substantially uniform cross-sectional shape throughout their length from filled billets by extrusion of the latter with either the replica or filler, which together comprise the billets, being formed from a plurality of stacked, thin plates. The plates are preferably indexed and keyed together to maintain the desired complex shape throughout the extrusion step.

3,673,668
VANE EJECTOR TOOL
Richard D. Crook, Topeka, Kans., assignor to Industrial Problem Solvers, Inc.
Filed Aug. 31, 1970, Ser. No. 68,337
Int. Cl. B23p 19/04
U.S. Cl. 29—254 10 Claims



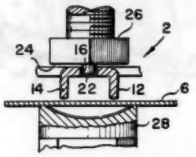
A tool for removing vanes from a jet engine compressor casing in the form of an arcuate plate having a plurality of projecting blades on one side thereof spaced apart and angulated to fit between the vanes in a jet engine together with projections on the outer end of each blade for engaging corresponding openings in the vane assembly in the jet engine compressor casing. The opposite surface of the arcuate plate is provided with an angulated socket having a rounded inner end for receiving the output member of an impact tool such as an air hammer to apply a driving force to the tool.

3,673,669
METHOD OF MAKING SIDE ENTRY CARD GUIDES
Woodrow O. Edstrom, and Charles H. Norling, both of Bloomington, Minn., assignors to Sperry Rand Corporation, New York, N.Y.
Filed Nov. 19, 1970, Ser. No. 90,992
Int. Cl. B23p 19/00
U.S. Cl. 29—428 6 Claims



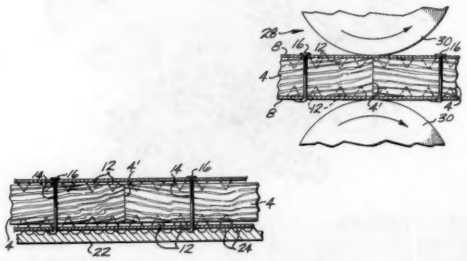
A method of forming a device for guiding and supporting a plurality of printed circuit cards incorporating electronic circuitry is disclosed. The device is formed of two sheet members having a series of tabs formed therefrom. The tabs of the two sheet members are oriented with the tabs of one sheet member extending through corresponding openings in the second sheet member forming pairs of opposing tabs between which printed circuit cards are compressively restrained. The sheet members may be of heat conductive and/or electrically conductive materials to function as a heat sink coupling means and/or as a ground/voltage bus for side entry of printed circuit cards.

3,673,670
METHOD FOR ATTACHING BRACKET MEANS TO AN IMPERFORATE SUPPORT
William O. Arnold, Jr., Parkersburg, W. Va., assignor to Union Insulating Company, Inc., Parkersburg, W. Va.
Division of Ser. No. 733,642, May 31, 1968, Pat. No. 3,522,924. This application March 17, 1970, Ser. No. 8,116
Int. Cl. B23p 11/00
U.S. Cl. 29—432.2 1 Claim



Bracket means, method and apparatus for securing an article such as an electrical wiring box to a sheet metal support, characterized in that the bracket means includes at least one stamped point extending downwardly into engagement with the support, said bracket containing an orientation opening adjacent the point. To effect penetration of the support by the points and crimping of the points relative to the support, cooperating jaw means are provided on opposite sides of the bracket and the support, one jaw face member having a male projection extending into the orientation opening to properly align the jaws relative to the points.

3,673,671
METHOD OF FABRICATING WOOD TRUSSES
George R. Petersen, Kent, Wash., assignor to P. H. Bowman Company, Inc., Seattle, Wash.
Filed Nov. 14, 1969, Ser. No. 876,625
Int. Cl. B23p 11/00
U.S. Cl. 29—432.2 12 Claims



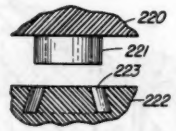
After the coplanar structural members of the truss assembly are arranged in end-adjacent array to form the necessary joints, a pair of toothed truss plates or the like is loosely applied to the sides of each joint; and a secondary fastener such as a clinch nail is impaled through the body of each member at each joint, and through the plates thereadjacent, so as to partially interlock the plates with the members in the plane of the assembly. So interlocked at the joints, the assembly is then passed in planar fashion through a roller press or the like, to flatten the plates against the sides of the joints, and to impale the teeth on the plates into the bodies of the structural members.

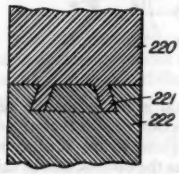
3,673,672

METHOD OF JOINING TWO BODIES IN CAPTIVE, INDEPENDENTLY ROTATABLE ASSEMBLY

Clemens A. Iten, Staunton, Va., assignor to Philip Morris Incorporated, New York, N.Y.

Division of Ser. No. 738,570, June 20, 1968, Pat. No. 3,541,683. This application Nov. 26, 1969, Ser. No. 877,584
Int. Cl. B23p *11/00*
U.S. Cl. 29—443 11 Claims





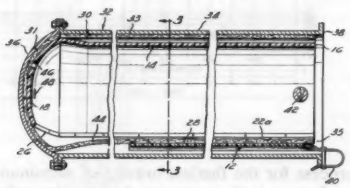
A safety razor of the clam shell type in which certain of the several components of the razor are of improved construction lending to reduction in manufacturing and assembling costs of the razor. Thus, spider bar movement for controlling the opening and closing of the cap members is effected by rotating a control knob connected to the bottom of a grip member in captive but independently rotatable movement therewith, the control knob being internally threaded for receiving the threaded lower end of a spindle which is fixedly connected at its upper end with the spider bar, the captive assembly of the control knob with the grip member being effected by plastically deforming a projecting part on the control knob in a n undercut groove in the grip member without allowing any adhesion between the two to occur. The spider bar also has a stem which is provided with a pair of lateral shoulders, at least one of which is adapted to abut on the underside of the razor bridge member when the spider bar is raised up to open the cap member thereby providing an upstop means to limit the degree of cap member opening and also to preclude accidental disengagement of the spindle from the control knob.

3,673,673

METHOD OF INSERTING A FLEXIBLE PREFORM IN A MOLD

Arthur J. Wiltshire, Cleveland, Ohio, assignor to Structural Fibers, Inc., Chardon, Ohio

Filed Feb. 4, 1970, Ser. No. 8,670
Int. Cl. B23p *11/02*
U.S. Cl. 29—451 7 Claims



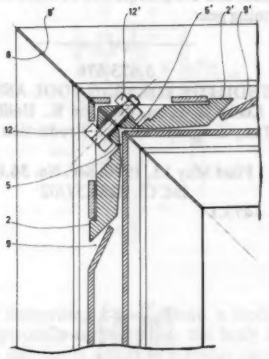
A method for inserting a flexible, oversized preform into an opening in a hollow mold is disclosed. The oversized preform is initially formed so as to have a configuration similar to that of the interior surfaces of the mold. The cross sectional size of the preform relative to the mold is temporarily reduced by forming an inwardly projecting furrow in the preform so that the preform may be inserted into the mold. An assembly for inserting the preform into the mold and reducing the cross sectional size of the preform as it is inserted into the mold is also disclosed.

3,673,674

METHOD FOR ASSEMBLING TOGETHER OF FRAME SECTIONS

Lyderic G. Catulle, Brussels, Belgium, assignor to S.A. Sodialox, Zug, Switzerland

Filed March 12, 1968, Ser. No. 712,539
Int. Cl. B23q *3/00*
U.S. Cl. 29—464 5 Claims



A process for the fitting of sections, particularly sections for metal carpentry, intended for the building of frames, the section being cut at 45°, comprising the steps of executing on the sections a local recessing of the cage in order to provide the sections with at least one notch and a corresponding number of oriented straps, inserting into each of the sections to be put together a fitting-element of an almost trapezoidal shape provided with at least one snug on the opposite side to the one provided with tenons and slots, the at least one snug serving the purpose of lateral guiding, this same element being also provided with a drilling perpendicular to the miter of the section cut at 45°, drilling to be found on the tenons and slots side and in the longitudinal axis of the section; bringing the at least one snug of the fitting element to the at least one corresponding notch provided on the section, at least one strap serving as guide for the purpose; fitting the sections together by joining the miters, and fitting the tenons and slots of the fitting element already inserted into the cage of a first section, into the slots and tenons of a similar fitting element previously placed in the cage of another section; introducing a tightening part into the drilling made on the two fitting elements, which in this manner prolong each other, and tightening the part into situ.

3,673,675

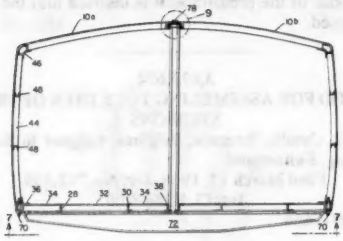
METHOD OF ASSEMBLYING A VEHICLE BODY

Walter S. Eggert, Jr., Huntingdon Valley, Pa., assignor to Boothe Airside Systems, Inc.

Filed Nov. 3, 1969, Ser. No. 873,422
Int. Cl. B23p *21/00*
U.S. Cl. 29—469 5 Claims

A method for assemblying a vehicle body that is manufactured in two equal but opposite half sections about a longitu-

dinal center line. This method provides welded frame, riveted and adhesive bonded skin for supporting portions of the load



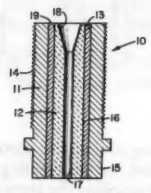
as shear panels, and cross bears and bolsters for supporting the body on running gear.

3,673,676

METHOD FOR FORMING TOOL ASSEMBLY

Everett H. Lock, Houston, and Joe K. Heilhecker, Bellaire, both of Tex., assignors to Esso Production Research Company

Filed May 13, 1970, Ser. No. 36,834
Int. Cl. B23k *31/02*
U.S. Cl. 29—473.1 **6 Claims**



A member composed of a hard, refractory ceramic is mechanically bonded to a ferroalloy support. The assembly is fabricated by placing the hard refractory ceramic member concentrically in an opening formed in the support; packing the space separating the two parts with a refractory hard metal powder; and at an elevated temperature, infiltrating the packed interval with a filler metal which wets the ferroalloy support and the refractory hard metal particles but not the refractory ceramic member. Upon cooling, the support and solidified filler metal contract about the ceramic member, holding it in place by compressive forces exerted thereon. The method can be used to fabricate a variety of tool assemblies for use in applications requiring hard, wear-resistant, high-temperature strength parts.

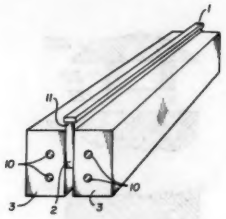
3,673,677

METHOD FOR BRAZING DISSIMILAR METALS AND COMPOSITE ARTICLES PRODUCED THEREBY

Kaj R. Loqvist, Fagersta, Sweden, assignor to Fagersta Bruks Aktiebolag, Fagersta, Sweden

Filed Feb. 5, 1970, Ser. No. 8,833
Claims priority, application Sweden, Feb. 14, 1969, 2059/69
Int. Cl. B23k *31/02*
U.S. Cl. 29—473.1 **9 Claims**

The invention provides a method of joining a first hard metal carbide article and a second article (preferably steel), said second article having a higher coefficient of heat expansion than said first article comprising positioning said articles adjacent each other and applying brazing filler metal to the joint between said articles and heating said brazing filler metal sufficient to braze said first and second articles together along said joint and then cooling said articles to obtain a permanent joint between them; and cooling said second article, while said



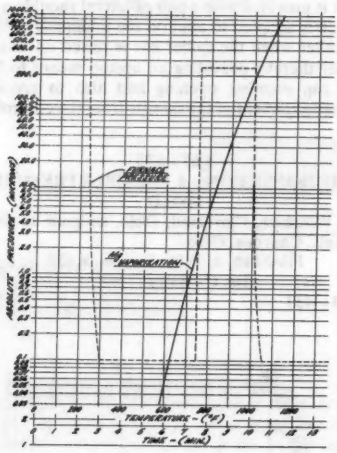
brazing filler metal is being heated, sufficiently so that the amount of contraction of said second article during the cooling period subsequent to the brazing is substantially of the same magnitude as the contraction of said first article. The invention is particularly applicable to the production of elongated articles and of rimmed wheels and includes such novel composite articles.

3,673,678

FLUXLESS BRAZING PROCESS

Glenn T. Moreau, and Irvin P. Bielefeldt, both of Rockford, Ill., assignors to Alco Standard Corporation, Valley Forge, Pa.

Filed May 8, 1970, Ser. No. 35,703
Int. Cl. B23k *31/02, 35/38*
U.S. Cl. 29—494 **4 Claims**

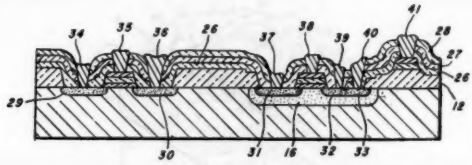


A process for the fluxless brazing of aluminum parts in a vacuum furnace in the presence of magnesium wherein a non-oxidizing gas is introduced into the evacuated furnace chamber to increase the pressure thereof and retard vaporization of at least part of the magnesium until just before the brazing temperature is reached.

3,673,679
COMPLEMENTARY INSULATED GATE FIELD EFFECT DEVICES

Bernard G. Carbajal, III; William Milton Gosney, both of Richardson, and Lou H. Hall, Dallas, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 1, 1970, Ser. No. 94,138
Int. Cl. B01j *17/00*; H01g *13/00*
U.S. Cl. 29—571 **11 Claims**

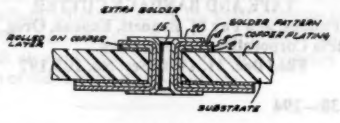


A complementary pair of insulated gate field effect transistors is fabricated in a monocrystalline silicon wafer. The method features the use of doped-oxide diffusion sources, self-aligned, passivated-gate electrodes, and the concurrent diffusion of the source and the drain regions for both the n-channel device and the p-channel device in a single step.

3,673,680
METHOD OF CIRCUIT BOARD WITH SOLDER COATED PATTERN

Edward Y. Tanaka, Huntington Beach; Darrel D. Cossaart, Garden Grove, and Norman B. Edwards, Placentia, all of Calif., assignors to California Computer Products, Inc., Anaheim, Calif.

Filed Dec. 14, 1970, Ser. No. 97,615
Int. Cl. H05k *1/18, 3/24*
U.S. Cl. 29—626 **7 Claims**

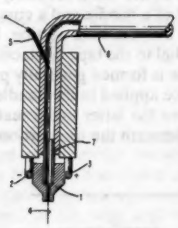


Printed wiring boards can be fabricated so as to leave a relatively thick solder layer where electrical and mechanical connections are required. Individual soldering operations can be eliminated using any one of several batch reflow soldering techniques.

3,673,681
ELECTRICAL CIRCUIT BOARD WIRING

James J. Steranko, Weston, Mass., assignor to Inforex, Inc., Waltham, Mass.

Filed April 1, 1969, Ser. No. 812,022
Int. Cl. H05k *3/30*
U.S. Cl. 29—626 **4 Claims**

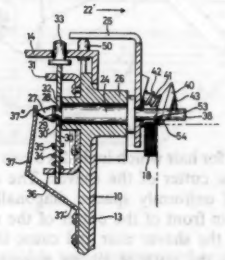


In the wiring of an electrical circuit on a circuit board having solder pads suitable for connection to circuit components, insulated wire passes through a solder tip which is moved relative to the position of the board. A portion of the wire extending from the head successively contacts the pads to which a wire connection is to be made. The application of heat to the insulated wire and the pad with which the tip is in contact sublimate the insulation on the wire and reflow solders the wire to the pad.

3,673,682
CAN OPENER DEVICE

Osamu Yamamoto, Kasugai-shi, Japan, assignor to Kabushikikaisha Aichidenkikosakusho, Kasugai-shi, Japan

Filed Aug. 20, 1969, Ser. No. 851,635
Claims priority, application Japan, April 23, 1969, 44/31914
Int. Cl. B67b *7/38*
U.S. Cl. 30—4 R **3 Claims**

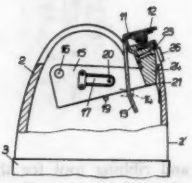


A can opener comprising a body frame, a feeder wheel, a movable frame pivotally supported on the body frame by a detachable shaft inserted in a bearing member carried by said body frame, a cutter rotatably supported by said movable frame and a holding mechanism for keeping said shaft in the inserted position, the shaft being pushed out toward the front of said body frame by operating said holding mechanism thereby making the cutter together with said movable frame easily removable.

3,673,683
SHEARING HEAD FOR DRY SHAVER

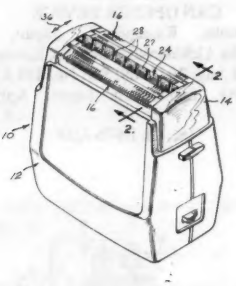
Richard Fischer, Frankfurt am Main, Germany, assignor to Braun Aktiengesellschaft, Frankfurt/Main, Germany

Filed July 13, 1970, Ser. No. 54,521
Claims priority, application Luxembourg, July 11, 1969, 59082
Int. Cl. B02c *19/10*
U.S. Cl. 30—34.1 **7 Claims**



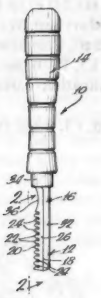
The shearing head includes a short hair shearing unit and a long hair shearing unit driven by a common reciprocating driving member. The long hair shearing unit is supported on a tiltable supporting member which can be angularly displaced and locked in a lifted position exceeding the top of the short hair shearing unit.

3,673,684
SHAVER WITH IMPROVED HAIR SETUP
Frank F. Muntz, 3164 South Third Street, Niles, Mich.
Filed Aug. 23, 1971, Ser. No. 173,882
Int. Cl. B26b *19/42*
U.S. Cl. 30—34.2 8 Claims



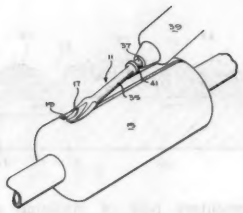
A shaver for hair which includes a hair setup part positioned adjacent the cutter of the shaver. The setup part includes a plurality of uniformly spaced diagonally extending grooves positioned in front of the cutter of the shaver which contact the skin of the shaver user and cause the hair thereon to be lifted up in the path of shaver movement with a resulting closer and smoother shave.

3,673,685
SHAPING AND RIBBING TOOL FOR BOWLING BALL FINGER HOLES
Salvatore J. Eppolito, 8649 Major, Stickney, Ill.
Filed Sept. 18, 1970, Ser. No. 73,444
Int. Cl. B26b *11/00*
U.S. Cl. 30—142 5 Claims



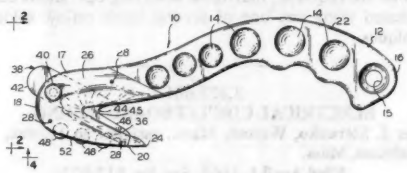
The shaping and ribbing tool for the finger holes in a bowling ball has a bit which is generally triangular in cross section with two sharp edges and a rounded edge. The first sharp edge is straight and is used to smooth or hone the interior of the finger hole. The second sharp edge is divided into a plurality of spaced teeth which is used to form finger gripping furrows and ribs or ridges in the finger hole. The third edge is rounded and acts as a bearing during use of the tool. A handle is secured to the bit's shank.

3,673,686
LEAD SLEEVE CUTTING TOOL
Neil W. Benedict, Jr., Evanston, Ill., assignor to Ajax Tool Works, Inc., Franklin Park, Ill.
Filed Dec. 21, 1970, Ser. No. 100,091
Int. Cl. B25d *3/00*
U.S. Cl. 30—168 6 Claims



A ripper tool usable with a pneumatic hammer or the like is provided to cut a soft ductile material such as a lead splice sleeve at a fast rate and with a clean cut. On a forward end of the tool is a ripper section having a pair of spaced toes for sliding along the sleeve and having a ripping tooth which projects inwardly into the sleeve and forces lead which, as it compresses and expands laterally, is forced rearwardly and upwardly through a wide slot between the toes and outwardly above the ripping tooth. Tools to make a circumferentially extending cut may be provided with a downwardly and forwardly projecting ripper section; and tools to make a longitudinally extending cut may be provided with an upwardly and forwardly projecting ripper section.

3,673,687
TAPE AND BANDAGE CUTTER
Cecil E. Phillips, and Fay M. Bennett, Eugene, Oreg., assignors to SaftPla Corporation, Eugene, Oreg.
Filed Dec. 31, 1970, Ser. No. 103,197
Int. Cl. B26b *29/02*
U.S. Cl. 30—294 2 Claims



A tape and bandage cutter has a reversely curved toe portion formed at one end of a handle and a curved cutting blade removably mounted in a slot in such portion. Part of the blade extends generally parallel to the tape contacting surface of the toe portion. The handle is formed generally parallel to the toe portion such that a force applied to the handle in the direction of the toe portion draws the latter underneath the tape to be cut. Rollers mounted beneath the toe portion facilitate movement over the skin.

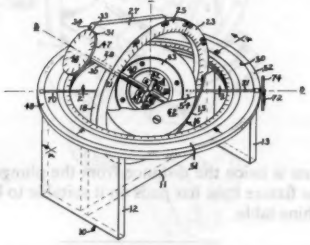
ERRATUM

For Class 32—22 see:
Patent No. 3,673,709

3,673,688
GEOLOGICAL MECHANICAL COMPUTER

George F. Garlick, Richland, Wash., assignor to Holosonics, Inc., Richland, Wash.

Filed Feb. 11, 1970, Ser. No. 10,359
Int. Cl. G06g *1/08, 3/10;* E21b *47/00*
U.S. Cl. 33—1 8 Claims

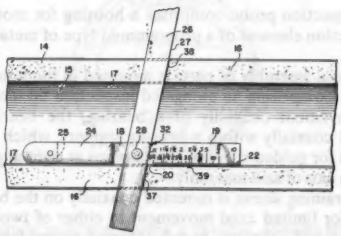


A geological mechanical computer is disclosed for displaying an analog of a stratum intersected by a borehole and determining the true dip and strike of the stratum from input information of the bearing and angle of inclination of the borehole and the structure angle and angle of orientation of the stratum with respect to the borehole. The computer has a stratum plane assembly mounted on a base for rotational movement about a vertical axis and pivotal movement about a horizontal axis. A shaft representing the borehole is operatively connected to a disc of the stratum plane assembly through a structure angle mechanism in which the shaft has a rotational axis that intersects the vertical axis and horizontal axis at a fixed intersection. A ring is rotatably mounted to the disc for rotation about the fixed reference in the plane of the stratum plane assembly. The ring has shaft elements extending therefrom having an axis coincident to the horizontal axis. A true dip pointer is radially affixed to one of the shaft elements for rotation about the shaft element. A protractor is freely suspended on the shaft element adjacent the pointer to visually display the true dip of the stratum plane assembly.

3,673,689
INSTRUMENT FOR MARKING PIPE INSULATION FOR MITER CUTS

Frank A. Magnotto, 3101 South 13th Road, Arlington, Va.

Filed April 7, 1971, Ser. No. 131,952
Int. Cl. B43l *7/06*
U.S. Cl. 33—75 R 4 Claims

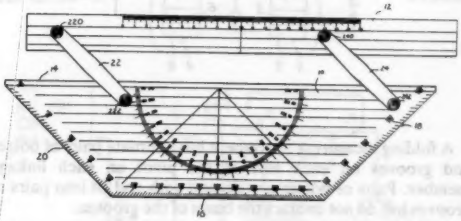


This specification discloses an instrument intended for field use in marking pipe insulation for the cutting of miters so that the insulation may be applied to a pipe elbow. The instrument comprises an elongate strip having a working face and flanges at one edge normal to the strip and extending in opposite directions from the strip. A straight edge is pivoted adjacent to one end to the strip and over the working face. The latter displays two sets of indicia. One of these is an angular index which indicates the angle which the straight edge is to assume with respect to an edge of the strip for a particular range of pipe sizes and the other is a lineal index which indicates where a second cut is to be made in relation to a first cut as determined by pipe size.

3,673,690
NAVIGATIONAL TRAPEZOID

Fernando De Barros, Rua do Dr. Antonio Candido-Lote 8-3° Esg., Parede, Portugal

Filed March 16, 1970, Ser. No. 19,690
Int. Cl. B43l *13/02*
U.S. Cl. 33—75 4 Claims

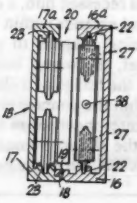


A navigational trapezoid to trace courses and azimuths on a chart and to inversely measure courses and azimuths in the form of an isosceles trapezoid to which an auxiliary ruler is coupled, the trapezoid having two opposite sides inclined at an angle of 45° to the larger base, and the trapezoid having two engraved protractors, one for use with longitudes of a chart as reference and the other for use with the latitudes as reference, the trapezoid also being engraved with lines parallel to the bases, and the auxiliary ruler also having lines engraved parallel to those of the trapezoid besides having a linear scale.

3,673,691
DRAFTING MACHINE

Leslie Arthur Gilbert, Glen Iris, Victoria, Australia, assignor to Ray And Gilbert Proprietary Limited, Victoria, Australia

Filed Dec. 11, 1969, Ser. No. 884,245
Int. Cl. B43l *13/02*
U.S. Cl. 33—76 5 Claims



A track-type drafting machine wherein the tracks are tubular enclosures each comprising channel-shaped members disposed in open face to face relation with one flange of each member interfitting with the corresponding flange of the other member and with the other flange of each member disposed in spaced relation to define a slot therebetween them which elements of the carriages extend.

3,673,692

FOLDING MEASURING INSTRUMENT WITH IMPROVED LINKAGE MEMBERS

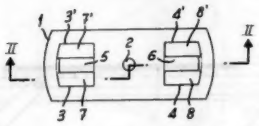
Andre Quenot, Besancon, France, assignor to Manufacture Quenot Mabo, Besanson, France

Filed Dec. 22, 1969, Ser. No. 886,872

Claims priority, application France, Dec. 30, 1968, 68182122. The portion of the term of this patent subsequent to Aug. 5, 1986, has been disclaimed.

Int. Cl. B43l 7/06; G01b 3/06

U.S. Cl. 33—118 2 Claims



A folding measuring instrument has alternate pairs of bosses and grooves on each side of the pivot on each linkage member. Pairs of bosses are aligned with and fit into pairs of grooves but do not contact the bases of the grooves.

3,673,693

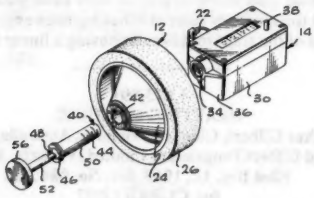
MEASURING WHEEL APPARATUS

Wallace D. Evans, Jr., Malibu, Calif., assignor to Rolatape Corporation, Santa Monica, Calif.

Filed Feb. 1, 1971, Ser. No. 111,561

Int. Cl. G01b 3/12; G01c 22/00; G01b 7/04

U.S. Cl. 33—141 R 9 Claims



A measuring wheel apparatus where the rotatable wheel is mounted upon a conical recessed hub, a counter mechanism is secured to the wheel and extends within the recessed hub, the counter mechanism being adapted to record the rotational movement of the wheel, the wheel being connected to the counter mechanism by the flange of a sleeve element which is threadably secured within the counter mechanism, the driving connection for the counter mechanism being established by a shaft passing through the sleeve element, the shaft being attached to a cap which is secured to the hub of the wheel.

3,673,694

SETTING DEVICE FOR A BORING TOOL

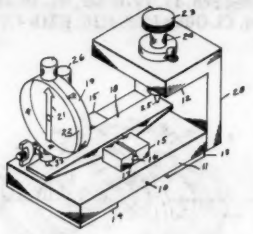
Robert Adam, 463 Nagle Road, Erie, Pa., and Dayle Keefer, R. D. #2, Luther Road, Girard, Pa.

Filed March 26, 1970, Ser. No. 22,877

Int. Cl. B27g 23/00

U.S. Cl. 33—185 R 3 Claims

This specification discloses a fixture suitable for use in machine shops for setting boring tools for boring holes to accurate dimensions. The fixture has a frame on which a dial indicator is supported in position spaced from a plunger. A rocking bar is supported on a fulcrum between the indicator and the plunger. The distance from the dial indicator point to



the fulcrum is twice the distance from the plunger to the fulcrum. The fixture base has pads on it suitable to be supported on a machine table.

3,673,695

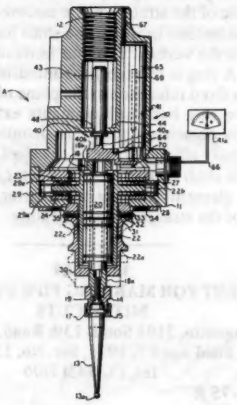
NON-TILTING PROBE

William F. Rethwish, Bonita, Calif., assignor to Rohr Corporation, Chula Vista, Calif.

Filed May 22, 1970, Ser. No. 39,934

Int. Cl. G01b 7/28

U.S. Cl. 33—174 L 10 Claims



An inspection probe comprises a housing for mounting on an inspection element of a programmed type of metal working machine.

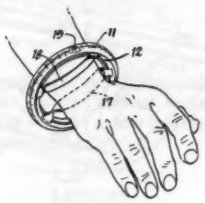
A coaxial assembly of parts is mounted in the housing, said assembly comprising an elongated inspection tip mounted for axial movement coaxially of a bearing, the bearing being mounted coaxially within a bearing support, which in turn is mounted for guided movement in a plane at right angles to the common axis of said assembly.

A restraining sleeve is mounted coaxially on the bearing assembly for limited axial movement to either of two adjusted, detent latched positions. In one adjusted, detent latched position of the restraining sleeve, the bearing assembly is restrained against lateral movement, but the inspection tip is free for movement axially of the assembly. In the other adjusted, detent latched position of the restraining sleeve, the inspection tip is restrained against axial movement but is free, with the bearing assembly, for guided movement in such plane at right angles to the inspection tip axis.

Electrical transducer means are actuated by movement of the inspection tip with the restraining sleeve in either of said

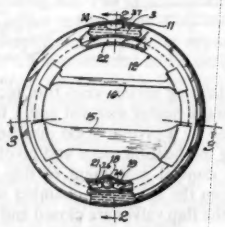
adjusted, detent latched positions to accurately measure and indicate the amount of inspection tip movement in either of said directions.

3,673,696
ATTITUDE INDICATOR
Gene B. Wasson, 1553 Gamon Road, Wheaton, Ill.
Filed Feb. 22, 1971, Ser. No. 117,352
Int. Cl. G01c *9/00*
U.S. Cl. 33—348 **9 Claims**



An attitude indicator, or detector, having a circular, annular transparent tube containing a liquid, preferably colored, and a gas bubble, the tube being shaped and constructed for encircling and for fastening non-rotatably upon the forearm and perpendicularly to the length of the forearm of a diver. The position of the bubble in the tube, responsive to the forces of gravity, enables the diver to determine at any moment the attitude, or angular position, of the tube with reference to the planes or lines of gravitational forces, the attitude of his forearm and body, and by visual comparison with the tube the attitude of visible nearby structures and surfaces, and, as well, the attitude of his existing or any contemplated line of travel. Illumination of the tube and its contents, preferably constantly, is provided by means of a light emitter such as radium or other light emitting substance, whereby the bubble may be viewed conveniently and frequently and its location comprehended instantaneously by the diver, whether he be in open waters or in dark areas or in murky waters.

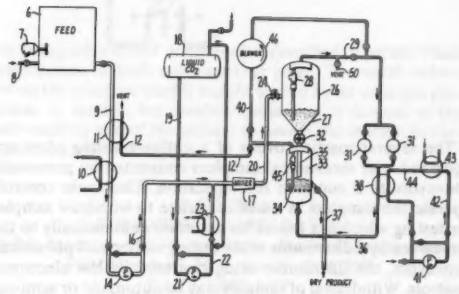
3,673,697
ATTITUDE INDICATOR
Gene B. Wasson, 1553 Gamon Road, Wheaton, Ill.
Filed Feb. 22, 1971, Ser. No. 117,353
Int. Cl. G01c *9/00*
U.S. Cl. 33—348 **10 Claims**



An attitude indicator having a circular, annular transparent tube containing a liquid, preferably colored, and a gas bubble, the tube being constructed for encircling and for being fastened non-rotatably upon the forearm, in a position perpendicular to the length of the forearm of a diver. The readily visible position of the bubble in the tube enables the diver to compare and determine instantly, at any moment, the angular attitude, with reference to gravitational lines of force, of the tube itself, the attitude of his forearm and body, and the angular attitudes of nearby structures and surfaces.

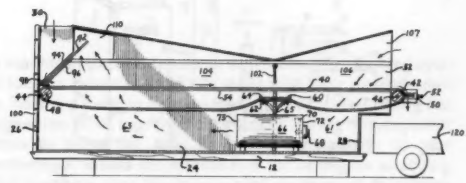
As this indicator is intended especially for use where light is absent, or minimal, or obstructed by dark colored sediment suspended in the surrounding water, strong illumination is provided. A battery powered lamp filament sends its light rays in a circular path through a strip of light-conducting plastic material, such as "Plexiglas," for example. The strip is positioned radially inwardly but adjacent to the tube, carrying adequate illumination to the tube contents throughout the entire tube length or circumference.

3,673,698
PROCESS FOR FREEZE DRYING WITH CARBON DIOXIDE
Albert S. Guerard, 3181 Bird Rock Road, Pebble Beach, Calif.
Filed Nov. 25, 1970, Ser. No. 92,791
Int. Cl. F26b *5/06*
U.S. Cl. 34—5 **4 Claims**



A continuous process is provided for the improved freeze drying of an aqueous solution to remove the water by sublimation from ice crystals to produce a dry product which can be reconstituted with water more readily than like products heretofore. Such aqueous solutions comprise coffee or tea syrups, fruit juices, milk, eggs, broths and the like.

3,673,699
GRAIN DRYING APPARATUS
James F. Buffington, R.R. #3, Plymouth, Ind.
Filed Jan. 29, 1970, Ser. No. 6,771
Int. Cl. F26b *17/04*
U.S. Cl. 34—66 **9 Claims**

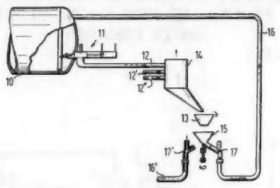


A grain drying apparatus having a housing and horizontally disposed porous conveyor. The housing is divided into a cool air compartment and a hot air compartment with a heating unit therebetween. A blower draws cool air through the grain on the conveyor in the cool air compartment and discharges it through the grain on the conveyor in the hot air compartment after the air has passed through the heating unit.

3,673,700
COFFEE ROASTING PLANT WITH AUTOMATIC SAMPLING ARRANGEMENT

Roland Schabbel, Emmerich-Huthum, Germany, assignor to Probat-Werke von Gimborn & Co. K.G., Emmerich, Germany

Filed Aug. 19, 1970, Ser. No. 64,963
Claims priority, application Germany, Sept. 11, 1969, P 19 46 132.6
Int. Cl. A23n *9/00*
U.S. Cl. 34—89 8 Claims

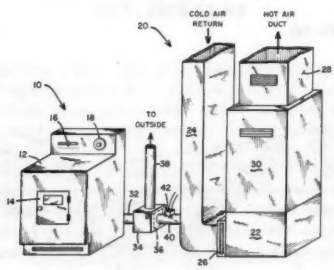


The several roasting ovens of a coffee roasting plant are equipped with mechanical samplers connected by pneumatic conveyors to a common testing station. Electronic controls operate the samplers in timed sequence to withdraw samples for testing which are thereafter returned automatically to the same oven by a distributor at the testing station and pneumatic conveyors, the distributor being operated by the electronic controls. Withdrawal of samples may be automatic or semi-automatic. Special design of samplers prevents mixing of material sequentially withdrawn from the same oven.

3,673,701
COMBINED BUILDING HUMIDIFIER AND CLOTHES DRYER

Robert V. Albertson, Wayzata, Minn.

Filed June 16, 1970, Ser. No. 46,614
Int. Cl. F26b *19/00*
U.S. Cl. 34—90 4 Claims

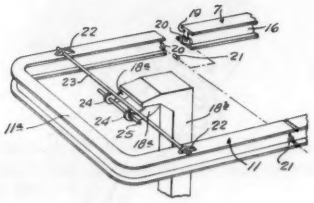


Moisture laden air from a clothes dryer is selectively directed either to the outside of the building or to the cold air return of the building's forced air heating system. Control means are provided for sensing the flow of air from the dryer to the cold air return for insuring that the motor driven blower of the forced air heating system is energized whenever the moisture laden air from the dryer is flowing to the cold air return.

3,673,702
APPARATUS FOR DRYING CLOTHING

Guillermo M. Obrador, Calle Vizcaya No. 341, Barcelona, Spain

Filed March 16, 1970, Ser. No. 19,756
Claims priority, application Spain, May 3, 1969, 366764
Int. Cl. F26b *13/00*
U.S. Cl. 34—162 1 Claim

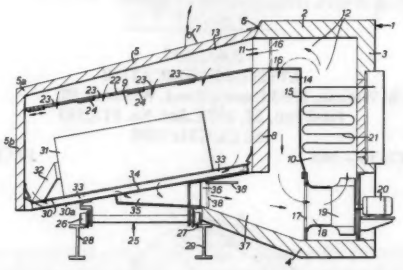


The present apparatus is for drying clothing by supporting and conveying clothing along an endless track which follows a right angular course and which has a loading and unloading zone, a shaker zone and a heating zone extending through a tunnel in which are located heating units and air exhausting units.

3,673,703
SHRINK-WRAP FILM HEATING APPARATUS

Friedrich Wieligmann, Westerkappeln, Germany, assignor to C. Keller, Laggenbeck/Westphalia, Germany

Filed Jan. 21, 1971, Ser. No. 108,477
Claims priority, application Germany, Jan. 22, 1970, P 20 02 786.5
Int. Cl. F26b *19/00*
U.S. Cl. 34—225 6 Claims



Apparatus for heating shrink-wrap film includes a heating space incorporating a heater element and a fan. A shrinkage chamber is formed by a pivotal hood disposed alongside the structure defining the heating space and pivotal movement of the hood effects control movement of flap valves in ducts leading to and from the shrinkage chamber so that when the chamber is open the flap valves are closed and vice versa.

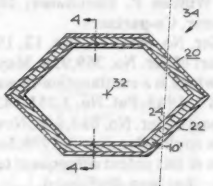
3,673,704
TEACHING DEVICE

Marguerite B. Dills, 770 West Twenty-sixth Street #B, San Pedro, Calif.

Filed Dec. 5, 1969, Ser. No. 882,536
Int. Cl. G09b *1/24*
U.S. Cl. 35—8 8 Claims

There is disclosed herein an improved teaching arrangement in which there is provided a thin strip-like body member that is foldable into a polygon such as a hexagon and has

material printed on the external faces thereof and on the internal faces thereof. The polygon is a thin rim-like polygon and hence, the internal faces are also visible. There is information



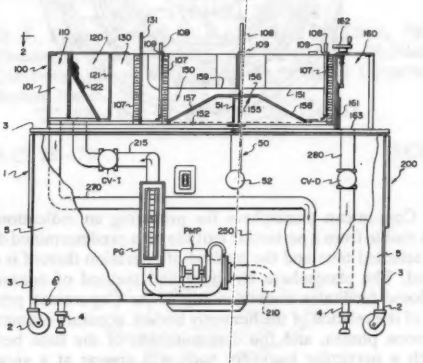
printed on the external faces and corresponding pertinent information is printed on the internal faces and the body member is enclosed in a holder means that maintains the body member in the polygon configuration.

3,673,705

EDUCATIONAL FLUID FLOW SYSTEM

David Ellis Wright, 13 Hornefield Road, Radlett, and John David Hardwick, 13 Princes Gardens, London, both of England

Filed March 9, 1970, Ser. No. 17,618
Int. Cl. G09b *23/12*
U.S. Cl. 35—19 R **15 Claims**



An educational fluid flow observation and measuring system, primarily a functional apparatus, which is designed to serve as an educational aid. The apparatus can be considered to consist of two major components: fluid circulation system and a fluid observation and measuring apparatus. The fluid circulation system is self-contained and is designed to pump a fluid, such as water, at a controllable flow rate from a sump to and through the observation and measuring apparatus and to return the fluid to the sump for recirculation. The observation and measuring apparatus contains various means for measuring and studying hydraulic and fluid flow principles and includes control devices for varying fluid inlet and outlet openings and a manually adjustable mechanism to permit the vertical variation of the fluid flow channel.

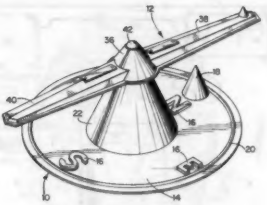
3,673,706

DEMONSTRATION COMPASS

Ralph Cavalucci, and John Walters, both of Cambridge, Mass., assignors to American Science & Engineering, Cambridge, Mass.

Filed June 8, 1970, Ser. No. 44,359
Int. Cl. G09b *23/18*
U.S. Cl. 35—19 A **12 Claims**

An educational or demonstration compass for classroom and teaching use. The compass is formed of molded plastic and includes a separable base and pointer. The base includes an integral compass card. The pointer is supported at its mid portion above the base by a needle pivot bearing which is secured to the center of the base. Bar magnets are embedded removably within sockets formed in the pointer, the bar magnets being color coded or otherwise identified to permit visual identification of their north-seeking poles. The north indication on the compass card is supplemented by an enlarged projection. A similar, but smaller, projection is formed at the north-seeking end of the pointer to permit the student to correlate these ends readily.

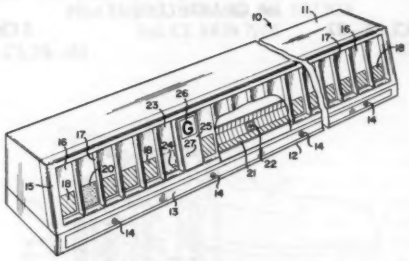


3,673,707

EDUCATIONAL APPARATUS

Virgil B. Manning, 978 Virginia Drive, Brevard County, Fla.

Filed March 15, 1971, Ser. No. 124,308
Int. Cl. G09b *1/06*
U.S. Cl. 35—35 D **6 Claims**



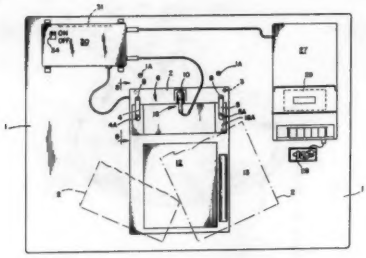
A teaching machine apparatus is provided for teaching symbols such as numerals or letters along with their interrelationship, having a flashing light source in a casing. The casing has a segmented front having each segment having a transparent portion to allow the light from the light source to pass therethrough. Means are provided on the casing for attaching coded members over the transparent portions of the casing which coded members have openings located in predetermined locations. A symbol bearing member can be placed over each coded member which member also has a predetermined opening therein. When the correct symbol bearing member is placed over the correct coded member their opening will align, allowing the passage of light therethrough. The unit also provides for a light reflector so that a lamp can be used for a plurality of transparent openings and also for the transparent openings to be covered with transparent colored material for providing different colored flashing lights.

3,673,708

MULTISENSORY TEACHING APPARATUS

Darwin K. Bevens, 394 Blair Avenue, Eugene, Oreg.

Filed Feb. 18, 1970, Ser. No. 12,189
Int. Cl. G09b 11/04
U.S. Cl. 35—37 2 Claims



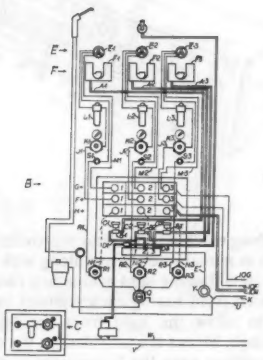
An apparatus for the teaching of handwriting skills wherein multisensory signals are fed back to the student to reinforce his learning process. Impairment of one or more of the students senses is overcome by the multisensory feedback by both auditory and visual signals. Grooved conductor plates and a stylus combine to train the students "muscle memory" with interchangeable plates of lessened groove depth being used as writing skill develops. Recorded instructions are provided the student and played upon completion of a circuit by stylus and plate contact.

3,673,709

DENTAL INSTRUMENT OPERATING SYSTEM

Richard W. Page, P.O. Box 258B, Old Salt Works Road, Chatham, Mass.

Filed July 17, 1970, Ser. No. 55,664
Int. Cl. A61c 11/02
U.S. Cl. 32—22 5 Claims



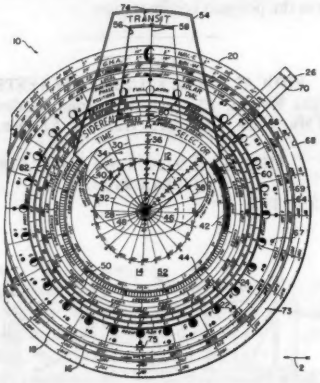
An arrangement of air-driven dental instruments is provided with foot control means for regulating supply of power air, syringe air and water and chip blower air, which, through pneumatically operated valve mechanism, controls air and water supplies. Bleed valve means, in the clip means for holding the cable of an instrument which is in use, operates selector valves for directing the controlled fluids to the proper instrument.

3,673,710

APPARATUS FOR PROVIDING A REPRESENTATION OF CELESTIAL BODIES

William A. Eisenhauer, Van Wert, Ohio, assignor to William A. Eisenhauer; William P. Eisenhauer; Ida J. Trust and Leigh E. Eisenhauer, Co-partners

Continuation of Ser. No. 600,920, Dec. 12, 1966, which is a continuation-in-part of Ser. No. 369,958, May 25, 1964, Pat. No. 3,290,799, which is a continuation-in-part of Ser. No. 271,658, April 9, 1963, Pat. No. 3,251,143, which is a continuation-in-part of Ser. No. 851,648, Nov. 9, 1959, Pat. No. 3,088,228. This application Jan. 5, 1970, Ser. No. 500. The portion of the term of this patent subsequent to Dec. 13, 1983, has been disclaimed.
Int. Cl. G09b 27/04, 29/00
U.S. Cl. 35—44 7 Claims



A Copernican planisphere for providing an indication of stars visible from a particular latitude on a predetermined date at a selected time and the method of operation thereof is disclosed. The planisphere structure and method of operation disclosed facilitates understanding of the Copernican principles of the relation of the heavenly bodies, accurate estimation of moon phases, and the determination of the time before which a particular heavenly body will appear at a viewing meridian, the rising and setting time of a heavenly body, the declination of heavenly bodies and the altitude thereof. Both astronomical and navigational information are provided on the planisphere disclosed.

The planisphere structure includes a plurality of concentric dials, which are progressively larger in diameter downwardly, centrally mounted for relative rotation on a pivot pin. The upper dial is a mask through which a portion of the dial below is viewable. The mask includes an indicator portion having a window therethrough extending radially outwardly over the remainder of the dials. A reference rule is pivotally mounted centrally of the dials at one end and extends radially beyond the outer diameter of the larger of the dials. The reference rule is positioned between the mask and adjacent dial.

3,673,711

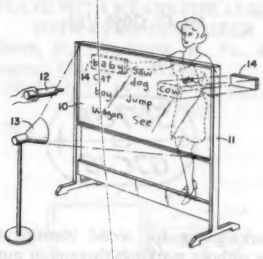
METHOD OF AND APPARATUS FOR VISUAL INSTRUCTION

Dolores J. English, Split Rock Road, Syosset, N.Y.

Filed Jan. 4, 1971, Ser. No. 103,492
Int. Cl. B43l 11/12
U.S. Cl. 35—62 3 Claims

An apparatus for visual instruction comprises a substantially planar translucent screen having an observation surface and a reverse surface, a writing instrument for writing alphanumeric

characters on one surface of the screen with an erasable writing medium, and means for illuminating the observation surface of the screen. The instruction apparatus further comprises means for enhancing the visibility of selected characters

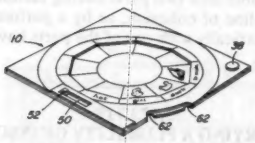


with respect to the rest, for example a series of reflecting blocks of white Styrofoam, of dimensions corresponding to predetermined characters and groups of characters, such blocks being adapted to be held on the reverse surface of the screen in registration with a selected character or characters.

3,673,712
EDUCATIONAL DEVICE

Paul F. Dacey, Nashua, N.H.; Samuel De Toma, Natick; Thomas F. Hayes, Woburn, and Matthew F. McNamara, Cambridge, all of Mass., assignors to EDUJ Corporation, Boston, Mass.

Filed Dec. 21, 1970, Ser. No. 100,216
Int. Cl. G09b *1/22*
U.S. Cl. 35—74 **8 Claims**



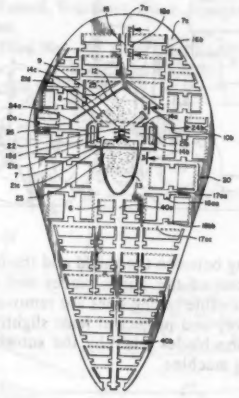
A rotatable dial, bearing pictures of common objects, is provided with a plurality of individual word cards which may be mounted to the dial by a pupil adjacent an identifying picture. The dial is provided with a word identification of each picture but the word is normally hidden from view being exposed only by a slide window by which the child confirms identification and word association. A transparent overlay is provided by which the child may trace the picture and word to further enhance word association.

3,673,713
HIGH-LIFT SNOW SHOE

Anthony Fedewitz, 44 Upland Way, Cedar Grove, N.J.

Filed May 27, 1971, Ser. No. 147,321
Int. Cl. A43b *00/00*
U.S. Cl. 36—2.5 AB **27 Claims**

In a preferred embodiment, a snow shoe of injection-molded polypropylene, the tread of the snow shoe having a plurality of resiliently polypropylene-hinged valve flaps angled downwardly at about 45°, as measured from a horizontal, within a respective open cell space per flap such that as the snow shoe — on the boot of the wearer — is pressed downwardly the snow causes the flap to move upwardly to thereby close-off the open space to substantially prevent large quantities of snow from passing through the open space, to cause the trapped snow pushing upwardly against the underside face of the flap to contribute to lifting force against the

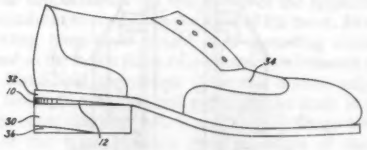


flap which is pressed against a stop "limiting means" thereby supporting the snow shoe tread and snow shoe wearer on top of the snow, but also such that when the snow shoe is lifted the snow collected on the upper face thereof and on the upper face of the flap falls through the open space as the flap returns resiliently to the downwardly angled molded position.

3,673,714
HEEL WEDGE FOR SHOE

Antonio Procopio, 4690 Clayton Street, Denver, Colo.

Filed May 12, 1971, Ser. No. 142,538
Int. Cl. A43b *7/16*
U.S. Cl. 36—81 **7 Claims**



A wedge, having an edge conforming to an exterior surface of the side of a shoe heel, is approximately the shape of one-half a heel, tapered from the exterior edge to the interior edge and has a series of elongated nail bracketing slots. The wedge is arranged to be forced between the nailed-on heel of a shoe and its sole to thereby compensate for a worn-down heel.

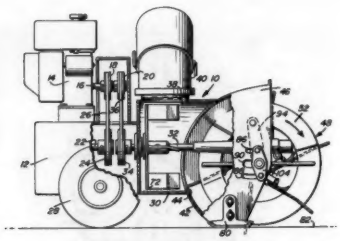
3,673,715
CONVERTIBLE SNOWBLOWER AND LAWN RAKE

Jerry J. Lines, 5327 Hampshire Avenue North, Minneapolis, Minn.

Filed Jan. 26, 1970, Ser. No. 5,873
Int. Cl. E01h *6/00*
U.S. Cl. 37—43 E **9 Claims**

A snowblower of the type including a forward transverse driven auger assembly provided with axially spaced opposite end right and left hand convolute auger blades and with the

rear peripheral portions of the auger assemble embraced in a forwardly opening generally semi-cylindrical transverse shield having a central outlet opening formed therein toward which loose material against which the auger blades are advanced is conveyed. The auger assembly is displaceable forwardly relative to the transverse shield from its usual position so as to increase the spacing between the shield and the opposing outer peripheral portions of the auger blades and a plurality of resilient and removable raking tines are removably carried by the auger assembly and project at least slightly radially outwardly beyond the blades whereby the snowblower is converted to a raking machine.



3,673,716

COMPRESSED AIR OPERATED APPARATUS FOR RAISING UNDERWATER DEPOSITS

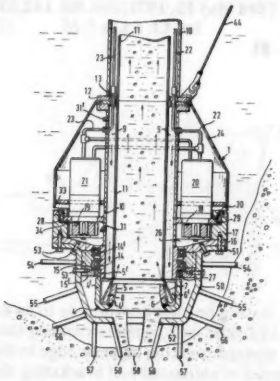
Alois Trondle, Wasserburger Landstrasse 209, 8000 Munich 82, Germany

Filed Sept. 22, 1969, Ser. No. 859,872

Claims priority, application Germany, Dec. 20, 1968, P 18 16 221.5

Int. Cl. E02f *3/92*

U.S. Cl. 37—61 **17 Claims**



Apparatus for raising deposits, using a pressure medium, the material being raised being conveyed via a dredge pipe from the deposit to a separator in which the material raised is separated from the pressure medium and possibly from entrained portions of a liquid medium disposed above the deposit, the pressure medium being introduced at the lower end of the dredge pipe into the latter with a rotational component and in such a manner that a partial vacuum is produced under the effect of which the material to be raised enters the dredge pipe, the inlet end of the dredge pipe being held during dredging at a small distance from the deposit.

3,673,717

WOOD MARKING TAGS

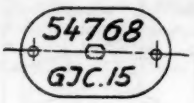
Kajetan Latschbacher, A 4484 Kronstorf 120, Austria

Continuation-in-part of Ser. No. 722,609, April 19, 1968, abandoned. This application Dec. 9, 1970, Ser. No. 96,573

Claims priority, application Austria, April 20, 1967, 3758; April 20, 1967, 3759; April 20, 1967, 3760; Nov. 30, 1967, 10809

Int. Cl. G09f *3/12*

U.S. Cl. 40—2 **10 Claims**



A wood-marking tag for wood identification purposes printed with or without markings thereon or punched therein, made of soft material, permitting its cutting without damage to the cutter means. The hardness of the tags is less than that of conventional saws made from steel alloys, to a degree avoiding dulling of the saw and optionally also permitting the punching of markings into said discs by means such as pliers and punchers. The material is preferably a glass-fiber reinforced plastic; preferably suitable for injection-molding. Optimum results are accomplished with plastics selected from the group consisting of 6-polyamide and ABS acylic nitrile-butadien-styrene-copolymers. The tag material in one embodiment is magnetically non-permeable, in another it includes metallic particles to make the tag magnetically permeable. The tag is equipped with projections applying it to the lumber such as for driving it into the lumber and/or for retaining the tag applied to the lumber thereon.

In one embodiment, the retaining projections comprise retaining clips, optionally with claws. In various embodiments, the tag is provided with indentations in its outer edge, with apertures near its outer rim, with barbs at its outer edge; with tubular projections at at least one side thereof; optionally with barbs on the tubular projection and/or with corrugated projections, optionally provided with barbs. In other embodiments, the tag is separable into two parts having identical markings, by a weakened line of cohesion, or by a perforated line, optionally asymmetrically with one of the parts having the shape of a segment.

3,673,718

PLATE CARRYING A PLURALITY OF INSCRIPTIONS

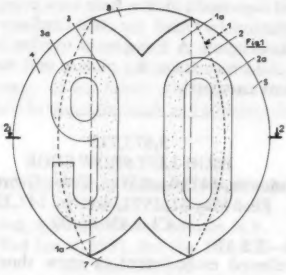
Piq Bernard, 07-Alissas, France

Filed Sept. 8, 1970, Ser. No. 70,447

Claims priority, application France, Sept. 11, 1969, 6931683

Int. Cl. G09f *3/20*

U.S. Cl. 40—5 **9 Claims**



A plate for carrying at least two separate inscriptions comprises a base plate adapted to be fixed on a support. The front

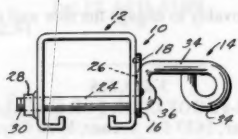
face of the base plate has a first inscription. Two flaps are hinged to the base plate and can be folded over the base plate, so that the first inscription is hidden and a second inscription is displayed on a surface of each flap.

3,673,719

INDICIA PLATE WITH MEANS FOR ALIGNING SAME WITH A FRAME MEMBER

Junius T. Moore, Jr., Charleston, W. Va., assignor to The Moore Company, Charleston, W. Va.

Filed July 27, 1970, Ser. No. 58,725
Int. Cl. G09f *3/08*
U.S. Cl. 40—20 R **5 Claims**



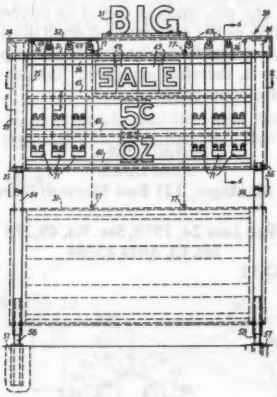
An indicia plate and bolt combination provide for both fastening and aligning of the plate relative to the surface of a frame member. The plate includes a pair of openings formed through it in spaced positions so that one opening can receive passage of a main shank portion of the bolt while the second of the openings can receive a portion of a curved section of the same bolt. The curved section is provided on the bolt by bending a portion of the bolt back onto itself by a limited amount to provide a curved section which fits into the second opening of the indicia plate.

3,673,720

CHANGEABLE SIGN

William S. Thornton, 204 Ella Street, Lafayette, La.

Filed Sept. 11, 1970, Ser. No. 71,517
Int. Cl. G09f *7/10*
U.S. Cl. 40—125 R **8 Claims**



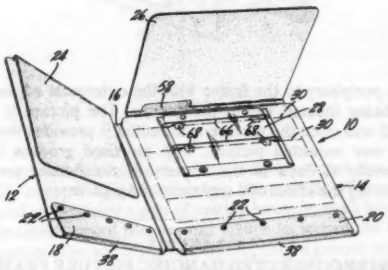
A changeable sign in which the letter panels form the background of the sign as well as carrying the indica. The letters carry horizontal tongues on their upper and lower edges which fit into grooves locking the letters therein. The framework of the changeable sign is mounted for vertical movement so that it may be lowered to the ground for changing the letters. End caps lock the letters in their groove support to prevent pilferage. Moveable guide poles are used to guide the framework as it is moved vertically to prevent damage to the sign and injury to the operator. Counter weights are used to support the weight of the sign through a system of pulleys so that the sign can be easily moved up and down as required.

3,673,721

RECORD CARD BOOK

George W. Wassell, Westport, Conn., assignor to Wright Barry Corporation

Filed Nov. 18, 1969, Ser. No. 877,685
Int. Cl. B42f *11/00*
U.S. Cl. 40—104.07 **18 Claims**



A book for card records and the like comprises a one-piece blank of polymeric sheet material scored and folded to provide front and rear covers and a back, the covers being hinged to the back along integral hinge formations constituted by spaced-apart, parallel, scored hinge lines along the parallel longer edges of the back. An inside spacer flap is folded back along scored lines at the bottom edge of each of the covers into overlying relation with the lower portion of the inside face of the cover and is secured along its free edge to the cover. An internal cover flap is bent in from the top edge along an integral hinge so that the cover flap can be folded down over material supported on the inside face of the respective cover or opened-out to reveal the contents of the book. Brackets for supporting hinge-type record card mounting elements are fastened to the inside faces of the covers underneath the cover flaps. Hand-hold formations along the bottom edge of the cover facilitate removing and replacing the book in a storage shelf or other receptacle, and a protective flange bridges the edge of the book between the top edges of the covers, preferably in a position near the back of the book, to prevent the book from accidentally being damaged by attempting to force it into a storage location with an object intruding between the two covers.

3,673,722

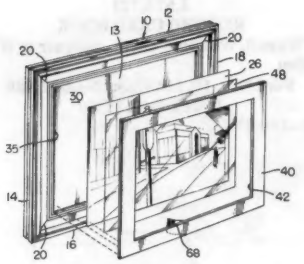
FRAME CONSTRUCTION FOR DISPLAYING PICTURES AND THE LIKE

Richard W. Robertson, Fort Wayne, Ind., assignor to Robertson Manufacturing Company, Inc., Fort Wayne, Ind.

Filed March 17, 1971, Ser. No. 125,052
Int. Cl. G09f *1/12*
U.S. Cl. 40—152 **14 Claims**

An improved frame construction enabling front mounting of articles and providing a rear mounting effect. The frame is of plastic composition and has a well and border members. The well includes a smooth front panel and a groove is formed coplanar with the front panel within the frame. The picture overlies the smooth front panel and there is overlying the pic-

ture a transparent non-marring and non-discoloring plastic sheet which is completely transparent. A mat having a pressure-sensitive adhesive at the outer periphery seals the transparent sheet cover to the picture and the outer periphery fits within the groove and adhesively secures the picture at its



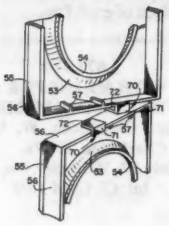
outer periphery to the frame with the outermost edges of the mat being located within the groove. The picture is totally sealed and once the picture is mounted it provides the effect of a rear mounted picture, with mortised grooves located diagonally at each of the corners of the border members, enhancing the effect of a rear mounted picture.

3,673,723
INTERCONNECTED HANGING PICTURE FRAMES
Burton A. Lazar, Chicago; Randall P. Bell, Oak Park, and John P. Vanderhoef, Evanston, all of Ill., assignors to Intercraft Industries Corporation, Chicago, Ill.
Filed March 12, 1971, Ser. No. 123,772
Int. Cl. G09f *1/12*
U.S. Cl. 40—152.1 **19 Claims**

The picture frames are of one-piece construction and are used for displaying pictures, photographs, or the like. Two projections protrude respectively from opposite points on the side wall of the frame. One projection of a first picture frame is inserted through an opening in the projection of a second picture frame which is attached to the wall. Thus, the first frame will hang from the second frame.

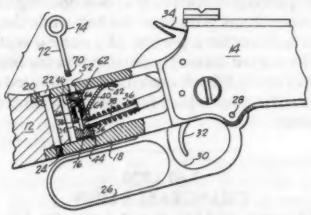
3,673,724
INTERCONNECTING PICTURE FRAMES
Randall P. Bell, Oak Park, and John P. Vanderhoef, Evanston, both of Ill., assignors to Intercraft Industries Corporation, Chicago, Ill.
Filed Nov. 25, 1970, Ser. No. 92,551
Int. Cl. G09f *1/12*
U.S. Cl. 40—152 **3 Claims**

The picture frames are of one-piece construction and used for displaying pictures, photographs, or the like. On one of the side walls of each frame is a hook which is constructed fric-



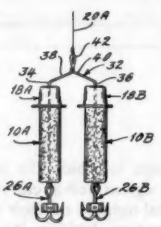
tionally and removably to engage the side wall of another picture frame.

3,673,725
TAMPER-PROOF LOCK FOR SMALL ARMS
James A. Cravener, 1627 5th Avenue, Ford City, Pa.
Filed Oct. 23, 1970, Ser. No. 82,932
Int. Cl. F41c *17/00, 17/08*
U.S. Cl. 42—1 R **6 Claims**



A safety lock for small arms, said lock preventing opening, breaking, loading or discharge of the piece. The lock comprises a pin mounted in a selected portion of the small arm. The pin is axially advanceable and retractable by means of a separate externally applied key which at all times is retained by the owner. The pin, when in one of its extreme positions, engages a portion of the conventional small arms mechanism to lock the gun against firing, loading or even opening of the action. The gun is, therefore, rendered "tamper-proof" until application of the appropriate key.

3,673,726
FISH LURE
Joseph W. La Montagne, 121 East Marceau Street, St. Louis, Mo.
Filed June 24, 1970, Ser. No. 49,275
Int. Cl. A01k *85/00*
U.S. Cl. 43—42.11 **8 Claims**



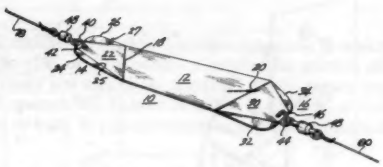
A fish lure having one or more body portions constructed of a relatively light buoyant substance and having a cup-shaped

member on the forward end thereof and a hook portion on the rearward end. The subject lure is designed and constructed to produce a jerky action when moving through and/or over the water, and is particularly designed to be used simultaneously with another, usually heavier lure, which enables it to be cast to a considerable distance and yet retains its action characteristics as a very lightweight lure.

3,673,727
FISHING LURE OR ATTRACTOR

Eddie Bauer, Bellevue, Wash., assignor to Simco, a co-partnership consisting of Eddie Bauer and Eddie C. Bauer, Bellevue, Wash.

Filed Sept. 2, 1970, Ser. No. 68,821
Int. Cl. A01k *85/04*
U.S. Cl. 43—42.51 **4 Claims**

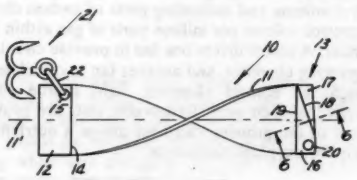


A novel trolling lure is disclosed which comprises an elongated plate or blade having an intermediate portion between an obtusely canted flat front portion and an obtusely but oppositely canted flat rear portion. The front and rear portions are joined to and cant from the intermediate portion at transverse bends or creases disposed angularly across the plate relative its longitudinal axis, oppositely thereto with respect to each other. The lure is provided with leading and trailing apertures disposed along the axis of the lure for the attachment of trolling lines. The front and rear portions each may have wings at their side edges standing from the obtusely canted faces, the wings at one being directed downwardly and at the other end upwardly with respect to the flat intermediate portion has been inserted. Preferably the wings on each portion are unbalanced as to area and this unbalance is opposite as between said two end portions and the lines along which the wings are bent are directed so as to intersect the lure axis.

3,673,728
FISH LURE

Roger G. Danbrova, 1206 South 11th Street, Manitowoc, Wis.

Filed April 29, 1971, Ser. No. 138,577
Int. Cl. A01k *85/04*
U.S. Cl. 43—42.51 **17 Claims**

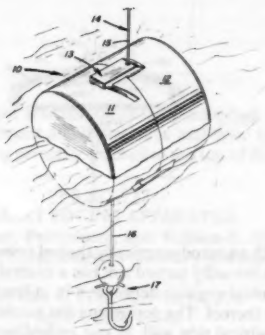


An elongated fish lure having a 180° circumvoluted spiral body member and having an angularly projecting tail and an angularly projecting deflector head both projecting on the same side of the lure. The tail section is substantially flat and is bent outwardly and rearwardly at an angle less than 90° to the longitudinal axis of the body member. The deflector head is bent outwardly and forwardly at angle less than 90° to the longitudinal axis of the body member.

3,673,729
FISHING FLOAT

Ervin E. Lintz, 1412 Martha N.E., Albuquerque, N. Mex.

Filed July 7, 1970, Ser. No. 52,886
Int. Cl. A01k *93/00*
U.S. Cl. 43—43.11 **5 Claims**

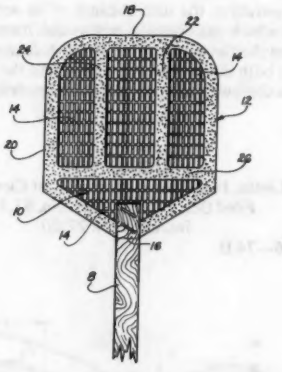


An improved fishing float, which includes means for automatically controlling and regulating the amount of drop-line to be used, comprising a pair of mating housings each having a freely rotatable spool therein and means to secure the housings together. The securing means comprises a groove and detent arrangement cooperating with resilient tongues and serves to cam the float open and closed upon application of a relative twisting motion to the housings. The spools are coupled together and a cast-line is wound onto one of the spools and extends to a fishing reel. A drop-line is wound on the other spool in the opposite direction from that of the cast-line so that as line is wound off one spool the other line is wound onto the other spool.

3,673,730
FLY SWATTER

John N. Hegenberger, Columbus, Ohio, assignor to Joseph J. Jacobs, Columbus; Joseph W. Loomis, Johnstown and Bruce A. Lehner, Columbus, Ohio, part interest to each

Filed Dec. 8, 1969, Ser. No. 883,096
Int. Cl. A01m *3/02*
U.S. Cl. 43—137 **1 Claim**

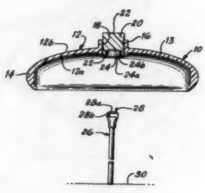


An improved fly swatter blade for killing insects without squashing them which consists of a perforated sheet of relatively resilient plastic material to which is bonded relatively thick cushioning strips formed of soft sponge-like plastic material.

3,673,731
REVERSIBLE AERODYNAMIC DISC AND GYROSCOPIC TOY

Raphael Farhi, and Edward H. Farhi, both of 1744 Monroe Avenue, New York, N.Y.

Filed June 21, 1971, Ser. No. 154,848
Int. Cl. A63h 1/32
U.S. Cl. 46—47 8 Claims

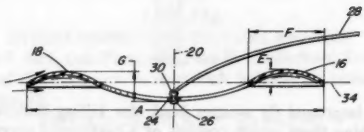


A disc with an aerodynamically shaped concave/convex surface and an inwardly turned rim has a central portion that includes a central circular depression in at least one transverse end surface thereof. The depression has a concave bottom and a right cylindrical side wall. In one embodiment of the invention, the central portion constitutes a readily removable and invertible plug so that the central depression may be arranged to face either inwardly or outwardly of the disc. In an alternative embodiment of the invention, the central portion is made integrally with the concave/convex surface and oppositely facing central depressions are formed on both (inner and outer) transverse end surfaces thereof. The disc is adapted to be spun by twirling an elongated wand the tip of which is in an inwardly or outwardly facing central depression of the disc, the disc being supported by the wand during such twirling. With the concave surface of the disc facing downwardly, twirling of the wand causes the disc to rotate, and after the disc is turning with sufficient speed a slight push of the wand in an upward direction will cause the disc either to hover or to sail through the air depending upon the magnitude and direction of the force applied by the wand and the speed of rotation of the disc. With the concave surface of the disc facing upwardly, either by inverting the central plug as in the first embodiment or by inverting the entire disc as in the second embodiment, a gyroscopic toy is provided. With the disc rotating and with its concave surface facing upwardly, the lower end of the wand the tip of which now is in the outwardly and downward facing depression can be placed on a flat surface where it will remain erect with the disc spinning on its upper end without any support for the wand. Should the wand be removed in this second mode of operation, the disc because of its aerodynamic configuration which generates a downward force, will descend and spin on the flat surface like a top. A feature of the invention is that both the central depression and the tip of the wand that coacts therewith are provided with low friction surfaces.

3,673,732
AERIAL TOY

Lance A. Liotta, 14004 Mont Avenue, East Cleveland, Ohio

Filed Oct. 15, 1970, Ser. No. 81,104
Int. Cl. A63h 27/00
U.S. Cl. 46—74 D 14 Claims

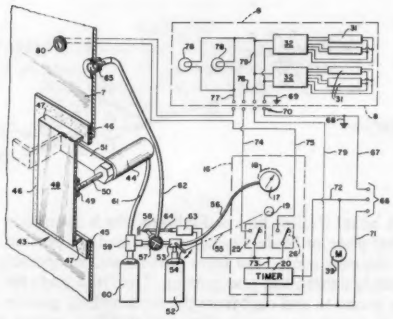


An aerial toy comprising a disc-like body having aerodynamically shaped surfaces adapted to be rotated about a center axis to which is connected an elongated elastic tether. The surfaces are shaped so as to provide lift during rotation about the axis and during lateral movement through the air in a direction perpendicular to the axis whereby the free end of the tether can be held and the disc thrown for flight away from and back to the user.

3,673,733
CONTROLLED ENVIRONMENT APPARATUS AND PROCESS FOR PLANT HUSBANDRY

Merton Allen, Schenectady, N.Y., assignor to Environment/One Corporation, Latham, N.Y.

Filed Nov. 26, 1969, Ser. No. 880,126
Int. Cl. A01g 9/14
U.S. Cl. 47—58 31 Claims



A controlled environment chamber for plant husbandry that is provided with a readily removable sealing top having therein separately sealed light source chamber containing incandescent and fluorescent lights. A control chamber is adjacent to the growing chamber and covered by the top for containing therein a fluid and electrical control circuit for energizing the lights in a timed cycle, individually manually controlling the lights, providing for the introduction of pressurized carbon dioxide into a control volume and simultaneously venting the growing chamber to the outside environment air when the lights are de-energized, discharging the carbon dioxide from the control volume into the growing chamber and simultaneously closing the vent when the lights are energized, and thermostatically controlling only the incandescent light for controlling the temperature within the growing chamber. The fresh air vent valve is spring closed and opened by means of an expansible chamber directly connected to the carbon dioxide control volume. The mixture of carbon dioxide within the growing chamber is controlled by means of a pressure regulator, and a pressure gauge determining the pressure within the control volume and indicating parts of carbon dioxide within the control volume per million parts of gas within the growing chamber. A motor drives one fan to provide circulation within the growing chamber, and another fan to circulate cooling air through the control chamber, light source chamber and through the open vent. Removable slats are provided in the bottom of the growing chamber above a nutrient filled tank for supporting plant containers.

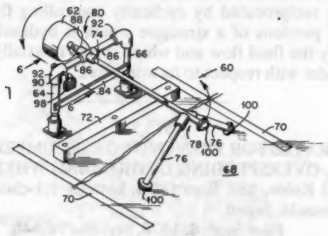
3,673,734
PARKING FIELD SECURITY DEVICE

Leonard Goldberg, 11 Sunrise Plaza, Valley Stream, N.Y.

Continuation-in-part of Ser. No. 27,600, April 13, 1970, Pat. No. 3,600,853. This application Dec. 2, 1970, Ser. No. 94,291
Int. Cl. E01f 13/00
U.S. Cl. 49—35 9 Claims

A security device for selectively blocking a parking space to prevent unauthorized use of the space. Stationary vertical sup-

port means set into the pavement of ground outside and adjacent to the parking space and a moveable barrier portion is pivotally secured to the support means so as to be swingable from an upper, vertical position in which the space is free for



use by a vehicle, to a lower, horizontal position in which the barrier portion extends across a substantial portion of the parking space and blocks use thereof. Locking means may be provided to lock the barrier in either horizontal or vertical positions, or both, to prevent unauthorized moving thereof.

3,673,735

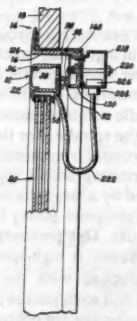
GLASS PANEL REFRIGERATOR DOOR

Robert J. Winsler, Elkton, Ky., and Frederic A. Richter, Chicago, Ill., assignors to Ardco, Inc., Chicago, Ill.

Division of Ser. No. 611,020, Jan. 23, 1963, Pat. No. 3,499,245. This application Dec. 31, 1969, Ser. No. 889,560

Int. Cl. E06b *7/12*

U.S. Cl. 49—70 **13 Claims**



A glass panel refrigerator door having a glass molding secured by screws to a flange on the door frame, a magnetic gasket mounted on the glass molding, and a gasket molding retaining the gasket on the glass molding and screwed to the glass molding while also clamping the glass molding under another flange on the door frame.

3,673,736

DEVICE FOR OPERATING SLIDING DOORS

Giovanni Marchiorello, Brenta, Italy, assignor to Inpat Establishment, Vaduz, Liechtenstein

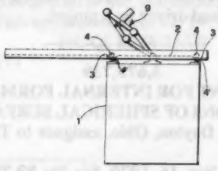
Filed Oct. 15, 1970, Ser. No. 81,034

Claims priority, application Italy, Oct. 17, 1969, 15589/69

Int. Cl. E05d *15/56*; **E05f** *15/06*

U.S. Cl. 49—235 **9 Claims**

An operator for opening and closing track suspended sliding doors in which motor means, acting on a parallelogram linkage (or pantograph) cause an initial upward and subsequent horizontal movement of the door during opening movement



thereof. The upper articulation of the pantograph is mounted for pivotal movement above the track and door and the bottom articulation is pivotally secured to the top of the door.

3,673,737

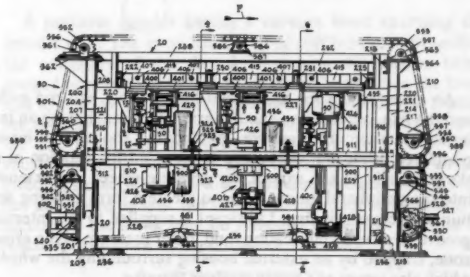
SHEET EDGING APPARATUS

Robert H. Welker, Perrysburg, and William L. Helmbrecht, Toledo, both of Ohio, assignors to Libbey-Owens-Ford Company

Filed May 4, 1970, Ser. No. 34,278

Int. Cl. B24b *21/16*

U.S. Cl. 51—38 **8 Claims**



Edge treating belt-grinder units are provided to produce, in sequences of operation, a desired ground surface on, for example, the lower corner, the upper corner and the vertical surface of a sheet or plate of glass. The glass is moved along a definite path and the abrasive belts are mounted for movement toward and away from the path. Monitoring elements act to control the grinder units in accordance with detected position and contour changes of the glass sheets.

3,673,738

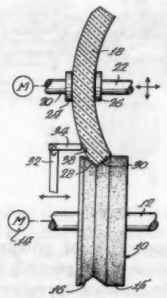
EDGE CONTROL DEVICE FOR GRINDING MACHINE

Theodore J. Stern, Skokie, Ill., assignor to A.I.T. Industries, Inc., Skokie, Ill.

Filed March 17, 1971, Ser. No. 125,175

Int. Cl. B24b *17/04*

U.S. Cl. 51—93 **9 Claims**



The edge control device includes an arm having an extension engageable with a face of an object as the edge of the

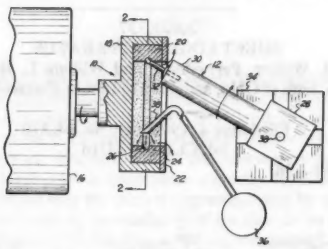
rotatably supported object is being beveled in the V-groove of a grinding wheel, the extension serving to deflect the lens toward one side of the groove. The arm is linearly adjustable by means of its attachment to a rack mounted for linear movement on a support and driven by a pinion.

3,673,739

ARRANGEMENT FOR INTERNAL FORM GRINDING PORTIONS OF SPHERICAL SURFACES

Dante S. Giardini, Dayton, Ohio, assignor to The Bendix Corporation

Filed Nov. 16, 1970, Ser. No. 89,790
Int. Cl. B24b *7/00*
U.S. Cl. 51—73 R **6 Claims**



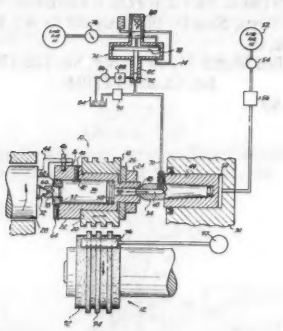
An arrangement for high speed lap grinding ball rod ends and the like including an annular grinding wheel having an internal semicircular groove extending about its inner periphery, while the workpiece is mounted for rotation at a skewed angle to the axis of the grinding wheel and extends into the peripheral groove so as to create a form grinding action with cross grinding. Lubricant is supplied to the internal groove to provide lubricating fluid under pressure in the grind zone, trapped by an external housing surrounding the wheel, which also serves as a safety retainer therefor.

3,673,740

GRINDING METHOD AND APPARATUS

Dante S. Giardini, Dayton, and Robert S. Szempruch, Springfield, both of Ohio, assignors to The Bendix Corporation

Filed May 25, 1970, Ser. No. 41,233
Int. Cl. B24b *1/00, 5/10, 5/16*
U.S. Cl. 51—95 WH **24 Claims**



A method and apparatus for grinding involving limited transverse reciprocation of the grinding wheel relative to the workpiece during the grinding operation to allow coolant to reach the grinding zone during deep form grinding and/or to improve the surface finish. The apparatus includes a first embodiment in which cyclical hydraulic pressure is used to continuously reciprocate a workholder against a pneumatic clamping bias in a direction transverse to the grinding action and parallel to the axis of rotation of the grinding wheel simultaneously with the grinding operation.

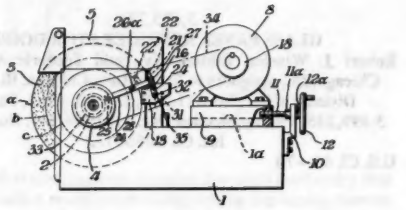
In a second embodiment, an internally ground workpiece is similarly reciprocated by cyclically controlling fluid flow to opposed portions of a structure which is hydraulically positioned by the fluid flow and which serves to axially locate the workholder with respect to its workhead.

3,673,741

APPARATUS FOR PREVENTING CIRCUMFERENTIAL OVERSPEEDING OF GRINDING WHEEL

Tsuyoshi Koide, and Ikuo Othu, both of 1,1-chome, Kariya, Asahimachi, Japan

Filed Sept. 8, 1970, Ser. No. 70,040
Claims priority, application Japan, Sept. 16, 1969, 44/87926
Int. Cl. B24b *55/00*
U.S. Cl. 51—134.5 R **4 Claims**



An apparatus for preventing circumferential overspeeding of a grinding wheel in a grinding machine wherein the rotating speed of the grinding wheel spindle is made variable through pulley exchange comprises a grinding wheel head with the grinding wheel spindle rotatably mounted thereto and a motor connected to drive the spindle. For the purpose of averting the hazard of circumferential overspeeding of the grinding wheel a large-diameter grinding wheel rejecting pin obstructs the space to be occupied by a large-diameter grinding wheel when a small-diameter high-speed pulley is connected to drive the grinding wheel spindle. This prevents the mounting of a large-diameter grinding wheel. A high-speed pulley rejecting pin is mechanically interlocked with the large-diameter grinding wheel rejecting pin and each moves in the same direction. The high-speed pulley rejecting pin obstructs the space to be occupied by the high-speed pulley when a large-diameter grinding wheel is connected to the spindle thereby preventing the mounting of the high-speed pulley.

3,673,742

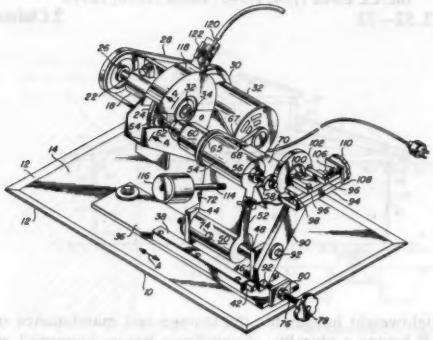
LAPIDARY MACHINE

Syril A. Colbaugh, Chloride Star Route 93, P.O. Box 210, Kingman, Ariz.

Filed Oct. 30, 1970, Ser. No. 85,560
Int. Cl. B24b *7/00, 9/00, 17/00*
U.S. Cl. 51—101 R **11 Claims**

A lapidary machine adapted to produce cabochon shaped gem stones or the like; the machine having a powered rotary grinding wheel provided with a cor toured in cross section annular grinding surface adapted to grind peripheries of cabochon shaped gem stones; a powered rotary dop holding shaft structure adapted rotatably to carry a dop supported gem stone in contact with said annular grinding surface; said

shaft structure axially parallel to and laterally movable relative to the rotary axis of said grinding wheel, said shaft structure having a generally oval shaped cam thereon; a normally stationary idler roller having a periphery engagable by said cam



and means for adjusting the position of the periphery of said idler roller in directions laterally relative to the rotary axis of said shaft structure in order to progressively cut peripheries of stones down and to produce cabochon shaped stones of various overall sizes.

3,673,743

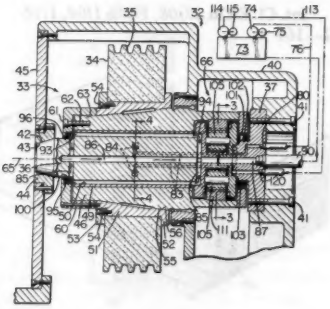
MACHINE ASSEMBLY

Dante S. Giardini, Kettering; Heinrich J. Wieg, New Burlington, both of Ohio, and The Bendix Corporation

Division of Ser. No. 760,307, Sept. 17, 1968, abandoned. This application Sept. 23, 1970, Ser. No. 74,879

Int. Cl. B24b *41/00*

U.S. Cl. 51—168 **26 Claims**



A rotatable support for a machine tool having a fixed spindle and a substantially tubular load-receiving member supported concentrically around the spindle with a fluid bearing provided therebetween and having a fluid motor for rotating the load-receiving member arranged so that its component portions are carried by both the fixed spindle and the load-receiving member whereby upon operating the fluid motor the load-receiving member is rotated in a vibration-free manner. Further, the fluid used to define the fluid bearing provides optimum cooling of the support and its adjoining components.

3,673,744

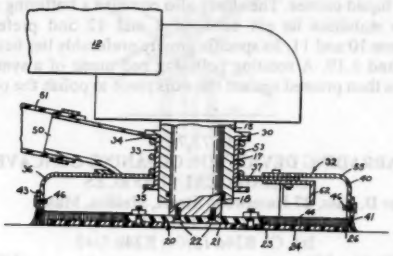
PORTABLE GRINDER

Anders Oimoen, East 2008 Third Avenue, Spokane, Wash.

Continuation-in-part of Ser. No. 56,553, July 20, 1970, abandoned. This application Feb. 12, 1971, Ser. No. 114,816

Int. Cl. B24b *23/00*

U.S. Cl. 51—177 **5 Claims**



A portable grinder having a vacuum hood enclosing the grinder disc. The hood has a wall of stiff bristles surrounding the periphery of the disc for engaging the surface being ground to permit air to flow through the bristles into the hood and to confine the dust particles inside the hood. The bristles are effectively spring biased to project the bristles forward of the disc to engage the surface before the disc to set up a vacuum in the hood before the grinding begins and after the grinding stops. While the disc is grinding the surface the bristles are biased against the surface to maintain the vacuum. A section of the hood may be removed to enable the disc to reach right up to an intersecting wall or surface.

3,673,745

AUTOMATIC SPRING FEED DEVICE FOR A SPRING GRINDER

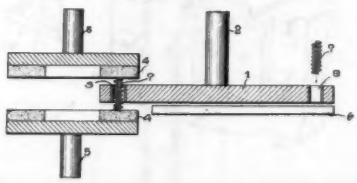
Shigeru Watanabe, and Michinobu Ito, both of Urawa, Japan, assignors to Showa Zoki Co., Ltd., Oaza Shinkai, Urawa, Saitama-Pre., Japan

Filed Feb. 11, 1970, Ser. No. 10,480

Claims priority, application Japan, Feb. 14, 1969, 44/10816

Int. Cl. B24b *47/02, 7/16*

U.S. Cl. 51—215 HM **2 Claims**

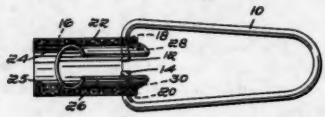


An automatic spring feed device for a spring grinder of the type which effects grinding of opposite ends of coiled springs by means of grinding wheels. The device is adapted to automatically insert one coiled spring after another in a number of spring holding openings formed equidistantly in the marginal portion of a rotary table of the grinder.

3,673,746
METHOD OF POLISHING GLASS
Carle W. Highberg, Sylvania, Ohio, assignor to Engelhard Hanovia, Inc., Newark, N.J.
Filed Feb. 3, 1971, Ser. No. 112,428
Int. Cl. B24b *1/00*
U.S. Cl. 51—283 14 Claims

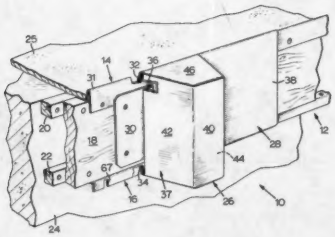
A glass workpiece is polished to obtain a surface having a high luster and a substantial absence of polishing defects by applying to the surface a slurry of a glass powder of substantially the same hardness and composition as the workpiece and a liquid carrier. The slurry also contains a buffering agent which stabilizes its pH between 8 and 12 and preferably between 10 and 11. Its specific gravity preferably lies between 1.14 and 1.19. A rotating polishing pad made of a synthetic fiber is then pressed against the workpiece to polish the piece.

3,673,747
ABRADING DEVICE FOR CLEANING CONCAVE CYLINDRICAL SURFACES
Arthur D. Pass, 27 Hazelwood Street, Malden, Mass.
Filed July 1, 1970, Ser. No. 51,638
Int. Cl. B24d *15/04*; B24b *5/40*
U.S. Cl. 51—370 3 Claims



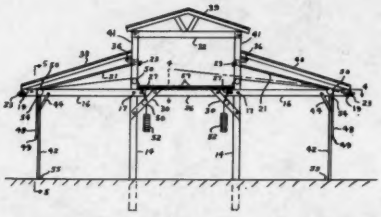
An abrading device to clean fittings and the like has an outer abrading member that receives a folded abrading sheet. The latter is retained in position by an inner retainer member that enters the outer member and retains the abrading sheet in position. A handle serves as a stop that predetermines the position of the abrading sheet on the outer abrading member.

3,673,748
FASCIA SECTIONS WITH INTERFITTING PARTS FOR BUILDING WALLS
Edward P. Minialoff, 3703 Beechollow Crescent, Mississauga, Ontario, Canada
Filed June 12, 1970, Ser. No. 45,877
Int. Cl. E04d *13/15*
U.S. Cl. 52—60 2 Claims



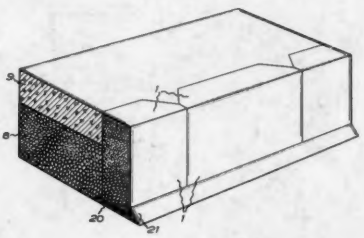
A fascia adapted to be mounted on a support on a side of a building adjacent to the roof. The fascia consists of sections each of which is adapted to be slidably engaged on the support and terminates at one end in a flap for fixing the section to the support. The flap is curved where it is connected to the main part of the section to form a recess for receiving an opposite end of a second fascia section. When in place, the opposite end of the second fascia section covers the flap on the first section to present a pleasing continuous appearance. Because each of the sections is fixed by one end only to the support, the sections are free to expand and contract both longitudinally and transversely with temperature changes.

3,673,749
AIRCRAFT STORAGE HANGAR
Julian H. Allen, 3700 Strathmoor Drive, Dayton, Ohio
Filed May 19, 1970, Ser. No. 38,676
Int. Cl. E04b *1/34*, *1/342*; E05d *15/40*, *15/48*
U.S. Cl. 52—73 2 Claims



A lightweight hangar for the storage and maintenance of aircraft having a plurality of cantilever beams supported on vertical columns with the cantilever beams extending beyond the columns to support floor beams for an upper storage area. Roof support members are secured to the vertical columns and the end of the cantilever beams. Trackless doors are suspended from the cantilever beams by means of cables connected to the doors on a line through the center of gravity of the doors. Guide arms are connected between the doors and the cantilever beams. A rod passes through each door and is connected to the arms to move the arms in synchronism. Door stops are provided at the top and bottom of each door.

3,673,750
BOTTOM FOR BUILDINGS WITHOUT BASEMENT, AND A METHOD OF MAKING SUCH BOTTOM
Kjell Arne Bokvist, Solna, and Curt Holger Ingestrom, Linkoping, both of Sweden, assignors to Aktiebolaget Svenska Icopalfabriken, Malmo, Sweden
Filed June 10, 1969, Ser. No. 831,907
Claims priority, application Sweden, June 10, 1968, 7760/68
Int. Cl. E02d *27/08*; E04b *1/04*, *1/16*
U.S. Cl. 52—169 8 Claims



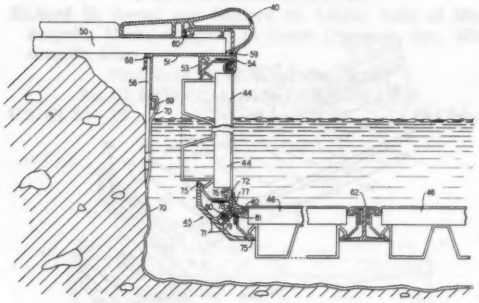
A bottom for buildings without basement founded on the soil after removal of only the humus layer and a method of making same. A foundation wall of heat and moisture insulating blocks having the same height as the foundation wall and placed in juxtaposition extends along the outer wall of the building, a heat and moisture insulating layer of pellets of burnt expanded clay is placed directly on the soil inwardly of the foundation wall, and a steel reinforced concrete layer is cast directly on top of the layer of pellets of burnt expanded clay using the foundation wall as form side wall, and is integrally united with the foundation wall.

3,673,751

BUILDING AND SWIMMING POOL CONSTRUCTION

Emil J. Boassy, Berkeley Heights, and Vincent Shanni, Scotch Plains, both of N.J., assignors to Champion Incorporated, Scotch Plains, N.J.

Filed July 21, 1970, Ser. No. 56,802
Int. Cl. E04h *3/16*
U.S. Cl. 52—169 7 Claims



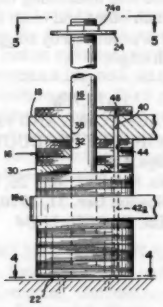
The specification describes a building panel with a snap engaging fitting for simplified interlocking of multiple panels to form building structures. The panels are especially suitable for swimming pool construction with a convenient crib-type arrangement that can be easily and quickly assembled.

3,673,752

CIRCULAR STAIR WITH CENTRAL SUPPORT AND DISC SPACERS BETWEEN TREADS

Kenneth M. Allen, 2301 South El Camino Road, San Mateo, Calif.

Filed July 17, 1970, Ser. No. 55,811
Int. Cl. E04f *11/00, 11/18*
U.S. Cl. 52—187 9 Claims



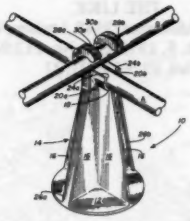
A circular stair comprising a central vertical support member of uniform cross-section and a series of treads with inner end portions that fit around the support member and extend horizontally from it. Disc-like spacers fit around the support member and between each pair of adjacent treads which are angularly spaced apart with respect to the central support member. Means are provided for applying a permanent compressive load on the spacers and treads from the ends of the central support to increase the load carrying capacity of the treads.

3,673,753

SUPPORT DEVICE FOR CONCRETE REINFORCING BARS

George C. Anderson, 8435 Birchcroft, Dallas, Tex.

Filed March 20, 1970, Ser. No. 21,379
Int. Cl. E04c *5/16*
U.S. Cl. 52—685 5 Claims



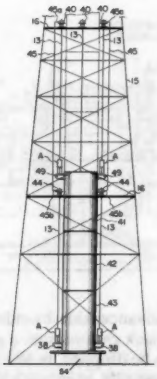
A concrete reinforcing bar support device is disclosed which includes a base supporting an upright pedestal. A lower clamping portion is supported by the pedestal which has a first rod-receiving open passageway therethrough. Resilient detents extend from the lower clamping portion to retain a reinforcing rod disposed through the first passageway. An upper clamping portion is provided which includes a pair of hook members extending from the lower clamping portion. Each of the hook members has a mouth opening in the same direction to define a second rod-receiving passageway which is normally disposed to the first passageway.

3,673,754

LIFT UP PROCESS

Hidekichi Murashige, Ichikawa; Masao Simakura, Tokyo, and Kazuo Nakazawa, Yokohama, all of Japan, assignors to Kawatetsu Kizai Kogyo Co. Ltd., Tokyo, Japan

Filed July 14, 1970, Ser. No. 54,803
Claims priority, application Japan, July 18, 1969, 44/57184; March 13, 1970, 45/21706
Int. Cl. E04g *21/24*; E04h *12/34*
U.S. Cl. 52—747 6 Claims



A lift-up process for constructing a tall tubular structure comprising providing a plurality of unit structures which, when combined together, form the tubular structure, engaging a first level unit structure with a plurality of guide rods at the same level, each of the guide rods having shoulders formed at an interval corresponding to the stroke of a piston of an incre-

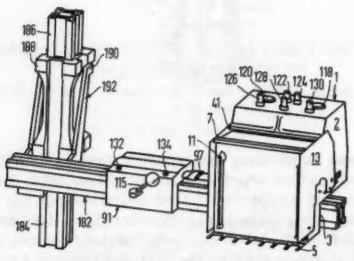
mental oil pressure jack, incrementally raising said unit structure by an oil pressure jack on each guide rod, placing a second level unit structure just below the first level unit structure and welding the first and second level unit structures together, and repeating the above steps to place and weld successive level unit structures.

3,673,755

DEVICE FOR PLACING TILES ON BUILDING WALLS OR THE LIKE

Herbert Christ, Bathildistrasse, 3548 Arolsen, Germany

Filed Feb. 5, 1971, Ser. No. 112,905
Int. Cl. E04g *21/22*
U.S. Cl. 52—749 **25 Claims**



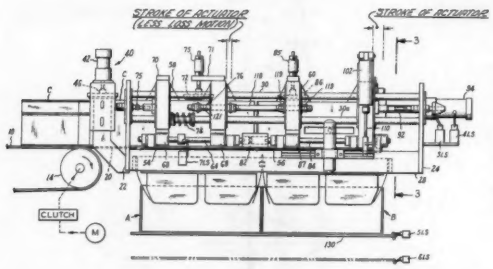
A device for placing tiles on building walls or the like area consisting of a stationary scaffold and a tile placement unit, said unit being guided along said scaffold and having means for pressing tiles on the area to be covered, a means for vibrating the pressing-on means to obtain a uniform distribution of mortar and means for feeding the tile to the press-on means.

3,673,756

APPARATUS FOR SIMULTANEOUSLY LOADING GROUPS OF ARTICLES INTO PACKING CASES

John A. Prete, Middletown, and John L. Raudat, Madison, both of Conn., assignors to Emhart Corporation, Hartford, Conn.

Filed Dec. 2, 1970, Ser. No. 94,463
Int. Cl. B65b *57/10*
U.S. Cl. 53—61 **14 Claims**



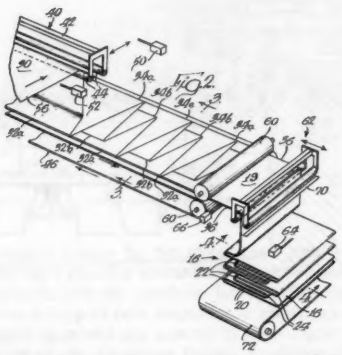
An infeed conveyor advances side-by-side lines of rectangular cartons, such as six pack cartons, into a grid structure from which the cartons are to be dropped, in two groups of four cartons each, into two upwardly open packing cases. The grid structure includes means for detecting the presence of eight cartons therein, and a line brake is set in response to the detecting means to hold back cartons on the infeed conveyor. The grid structure includes a fixed frame in which two shifting carriage portions are slidably mounted for movement through different displacements in the downstream direction, and each carriage portion carries one of said carton groups. After being so shifted the two carton groups are dropped downwardly through doors in these carriage portions and into the upwardly open packing cases.

3,673,757

METHOD OF MAKING PILLOWS

Arnold L. Willis, 1000 North Lake Shore Drive, Chicago, Ill.

Filed Jan. 4, 1971, Ser. No. 103,639
Int. Cl. B65b *63/04*
U.S. Cl. 53—21 FW **11 Claims**



An improved method for making three- or four-way taper pillows from a web of soft compressible material that is folded into a batt and encased in a pillow tick. This is accomplished by folding the web along first fold lines to produce a multi-ply web having a plurality of superimposed plies located between opposite edges while positioning some of the fold lines between the opposite edges such that there are a greater number of plies along the center of the multi-ply web then at the opposite edges and subsequently folding the multi-ply web along second fold lines extending perpendicular to the opposite sides of the multi-ply web to produce a pillow batt having a plurality of layers each having a plurality of plies. The batt is then enclosed in a pillowed tick by compressing the peripheral edge to produce a completed pillow.

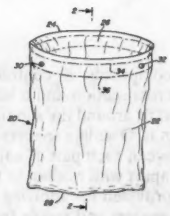
In one embodiment, a three-way tapered pillow is produced by locating all of the fold lines along one edge of the layers in a common plane while the fold lines along the opposite edge are staggered relative to each other and in an alternative embodiment a four-way taper is produced by staggering the fold lines of the layers along both edges.

3,673,758

METHOD OF PACKAGING AND PRESERVING PERISHABLE PRODUCTS

Joseph J. Esty, San Diego, Calif.

Division of Ser. No. 827,852, May 26, 1969, Pat. No. 3,610,516. This application Dec. 21, 1970, Ser. No. 100,338
Int. Cl. B65b *31/04*
U.S. Cl. 53—22 B **10 Claims**



The steps in the method of preserving a perishable product in a container formed of impermeable material, which steps

comprise purging the container with an inert fluid after the product is in the container, and after the purging step, sealing the container against the ingress of environmental air. The container is provided with a product inlet opening, with openings for the ingress of inert fluid and for the egress of air and for sealing the container (1) after the product is within the container and (2) after completing the purging.

3,673,759

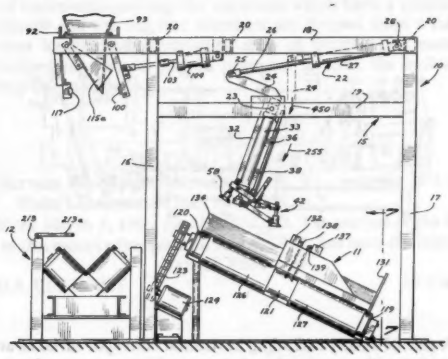
BAG HANGER APPARATUS

Richard H. Ayres, and Gaylerd M. Lieder, both of Minneapolis, Minn., assignors to Bemis Company, Inc., Minneapolis, Minn.

Filed April 22, 1970, Ser. No. 30,681

Int. Cl. B65b *43/18*; B65h *3/08*; B65g *43/08*

U.S. Cl. 53—29 **49 Claims**



For filling bags, a V-trough conveyor to receive a filled bag from a hopper assembly, a longitudinally elongated bag magazine to hold spaced stacks of bags in an inclined condition, a first piston cylinder combination to reciprocate vacuum cups and a break rod to abut against one bag side wall and to partially open the bag mouth as said cups and rod are retracted, a second piston cylinder combination to rotate the first combination between a bag pick up position and a hopper assembly transfer position and a third piston cylinder combination to relatively move a bag clamp and a hopper jaw from a hopper jaw closed position to receive a partially opened bag from the cups when the second combination is in the transfer position and a bag release position.

3,673,760

PACKAGING METHOD AND APPARATUS

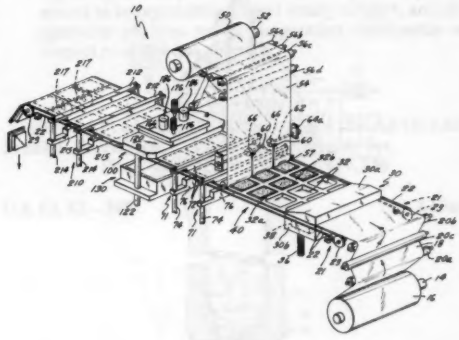
Ernest V. Canamero, Fair Lawn, N.J., and Christoph Ullmann, St. Mang/near Kempten, Germany, assignors to American Can Company, Greenwich, Conn.

Filed Oct. 26, 1970, Ser. No. 83,902

Int. Cl. B65b *31/02*

U.S. Cl. 53—22 A **18 Claims**

An automatic packaging machine makes hermetically sealed packages from which air has been exhausted by laminating two continuous sheets of packaging material. A roll of film on one end of the machine supplies a continuous support sheet to a chain belt conveyor which grips the opposite edges of the support sheet leaving the web unsupported, and transports this sheet the length of the machine. A vacuum forming die makes a plurality of receptacles in the support sheet in aligned longitudinal and transverse rows with transverse and longitudinal margins about the periphery of the receptacles. Another roll of film supplies a continuous cover sheet which is applied over the support sheet, the cover sheet being expediently severed longitudinally by a cutting blade in alignment with the inner longitudinal margins between the receptacles prior to application over the support sheet. The sheets are then heat sealed along the transverse margins. Subsequently, an evacuation unit heat seals the sheets along the outer longitudinal edge margins and an evacuation head exhausts the air from the receptacles through the evacuation opening advantageously provided by the severed cover sheet. A sealing bar in the evacuation head then closes the opening and the cover sheet is finally heat sealed to the support sheet in the areas adjacent the opening.



3,673,761

METHOD OF APPLYING PILFER-PROOF CLOSURES

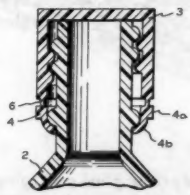
Wilfried Leitz, Mullheim/Baden, Germany, assignor to CIBA-Geigy AG.

Continuation-in-part of Ser. No. 810,113, March 25, 1969, abandoned. This application Feb. 4, 1971, Ser. No. 112,735

Claims priority, application Germany, March 30, 1968, L 47079; July 23, 1968, P 17 79 252.8

Int. Cl. B65b *7/28*

U.S. Cl. 53—42 **4 Claims**



Method of applying a pilferproof closure which has a capping portion and has joined thereto along a failure line of reduced strength a security ring which has adjacent said failure line an annular portion from which extends a skirt portion having a thickness less than that of the annular portion. The closure member is formed from thermoplastic material and the skirt portion is warm rolled onto an undercut section of the neck of a container without heating the material at the failure line so as to distort it.

3,673,762

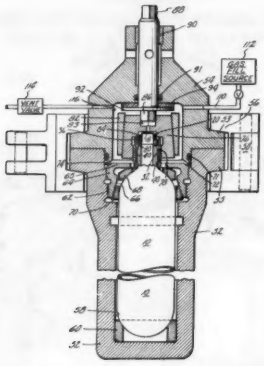
APPARATUS FOR FILLING A PRESSURE VESSEL

Herbert G. Bock, Farmington, and Walter J. Szerejko, Newington, both of Conn., assignors to Chandler Evans Inc., West Hartford, Conn.

Division of Ser. No. 856,226, April 29, 1969, Pat. No. 3,577,696. This application April 23, 1971, Ser. No. 136,860

Int. Cl. B65b *31/02*

U.S. Cl. 53—86 **5 Claims**



A filling fixture has a flanged base having a cavity and a cover having a bore. The base and cover are urged together by a hinged split ring to form a fluid tight enclosure receiving a gas storage vessel. A rotatable shaft is mounted in the cover to engage and tighten a cap on the vessel.

3,673,763

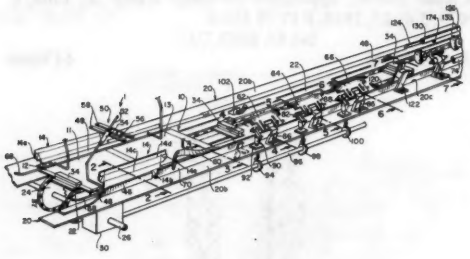
CARTON ERECTING AND PACKAGING MACHINE

Oskar Dorfmann, North Bergen, N.J., assignor to Grand-City Container Corporation, North Bergen, N.J.

Filed June 26, 1970, Ser. No. 50,238

Int. Cl. B65b *5/02, 11/18*

U.S. Cl. 53—183 **25 Claims**



Automatic carton erecting and packaging machines for single blank (one part) and double blank (two part) cartons are described. Tubular bumpers are automatically formed on initially flat carton blanks in a low friction operation by folding the side flaps of the blanks over a forming bar with a series of roll over cams. The newly formed bumpers are then brought into engagement with a series of double angle wheels which simultaneously apply lateral and downward pressure to the bumpers to insure that their cross-sections form true squares or rectangles. The forming bar, the roll over cams and the double angle wheels are easily adjustable in the horizontal and vertical directions so as to accommodate carton blanks of various sizes. Also, the angular positions of the roll over cams and the double angle wheels are easily adjustable. A contoured flight which pushes the carton blank through the bumper forming and gluing operations also engages the article to be packaged and inserts it into proper position in the carton blank. In the double blank carton machine, the filled carton and its cover are simultaneously conveyed into engagement for the final gluing and closing operation. In the single blank carton machine, a rotating roll-over bar closes the carton cover as it is conveyed to the final gluing and closing operation.

3,673,764

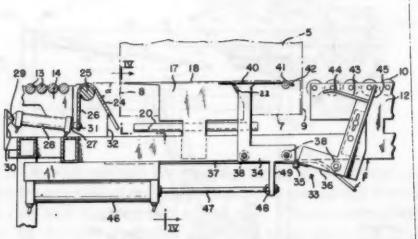
BOTTOM FLAP FOLDING AND CONVEYING APPARATUS

Jack T. Bell, Olympia, Wash., and Barton K. Smith, Winnetka, Ill., assignors to Weyerhaeuser Company, Tacoma, Wash.

Filed March 29, 1971, Ser. No. 128,789

Int. Cl. B65b *7/20*

U.S. Cl. 53—374 **9 Claims**



A pair of axially extending horizontal conveyor surfaces are provided with a space therebetween which accommodates a bottom flap folding and conveying apparatus. Stationary support members which are on the same horizontal level as are the conveyor surfaces accept the incoming product for packaging. A movable carriage having a downstream supporting portion and an upstream combination support-folder pusher plate portion operates in the axial direction through the utilization of an air or hydraulic cylinder and carriage track. After a carton is placed over the product the bottom end flaps are folded upwardly in a manner which positions them adjacently underneath the product. The upstream bottom end flap is folded by the combination support-folder pusher plate which not only folds the flap but causes the carton and product to be moved axially toward the output conveyor surface while supporting a portion of it. The downstream bottom end flap folding means can be either movable or stationary.

3,673,765

PACKAGING DEVICE

Arnold Dohmeier, Lienen, and Diether Schwedhelm, Osnabruck, both of Germany, assignors to Dohmeier & Strothotte KG, Lienen, Germany

Filed June 1, 1970, Ser. No. 41,873

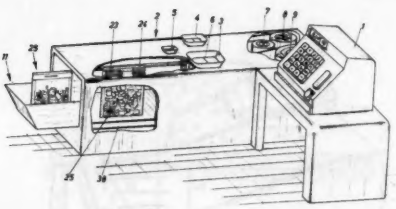
Claims priority, application Germany, June 6, 1969, P 19 28 661.4

Int. Cl. B65b *43/12, 67/04, 7/02*

U.S. Cl. 53—187 **9 Claims**

A device for packaging goods, such as in a supermarket and the like, is arranged to pack the goods in a flexible bag-like member held in an open position at a loading station and, after the loading operation is completed, the bag-like member is sealed and delivered to a pick-up station in an automatically performed operation. Belts convey the bag-like members individually to the loading station where the members are

opened for carrying out the packing operation. Other belts convey the packed bag from the loading station to the pick-up station and at a point between the loading station and the pick-up station the mouth of the bag is sealed. A belt conveyor can be used to support the packed bag-like member from the loading station to the pick-up station. The bag-like members



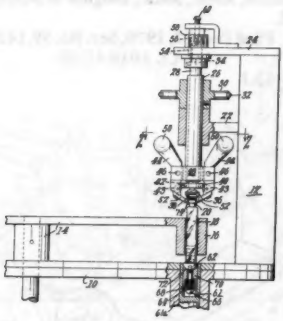
are withdrawn from a supply roll containing a continuous strip of interconnected bag-like members which have a reinforced mouth and the bag-like members are formed from a folded over longitudinally extending strip of flexible film material welded together at spaced positions to form the individual bag-like member.

3,673,766

SEALING CLOSURE CAPS

Norman W. Melott, Moundsville, W. Va., assignor to Cook-Waite Laboratories, Inc., New York, N.Y.

Filed March 8, 1966, Ser. No. 532,663. The portion of the term of this patent subsequent to July 4, 1987, has been disclaimed.
Int. Cl. B65b 7/28
U.S. Cl. 53—335 **10 Claims**



1. Apparatus for sealing skirted closure caps onto containers having open mouths, comprising a support for the containers each of which has one of the skirted closure caps thereon closing the mouth thereof, with the skirt depending circumferentially thereabout,

rotatably mounted sealing means rotating on an axis substantially coaxial with the cap and the skirt thereof, means rotating the sealing means, the sealing means being axially fixed but movably mounted to tend to move radially inwardly to engage the cap at the skirt portion thereof by centrifugal force, means restraining said sealing means against moving inwardly whereby the sealing means normally stays in spaced relation with respect to the cap without impinging upon it,

and means interdicting the action of the cap sealing motion restraining means to allow centrifugal force to move the cap sealing means toward the container cap and impinge upon the same to seal it relative to the mouth of the container,

the cap sealing restraining means being movable between an operative position where it engages the sealing means and limits the inward motion thereof due to the centrifugal action, and an inoperative position where it wholly releases the sealing means, and means to move the container in a direction to engage and move the cap sealing restraining means from operative to inoperative position,

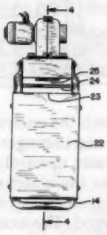
a rotary support for said cap sealing means and means to rotate it thereby rotating the cap sealing means, said cap sealing restraining means including a rotary member having an operative position for restraining the cap sealing means in engagement with said rotary support, and an inoperative position out of cooperation relationship with respect to said rotary support.

3,673,767

APPARATUS FOR LOADING BAGS WITH ARTICLES

Frank J. Hutchinson, 613 Ridgedale, Garland, Tex.

Filed Nov. 24, 1969, Ser. No. 879,230
Int. Cl. B65b 43/36
U.S. Cl. 53—385 **8 Claims**



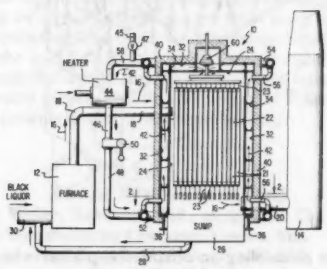
Apparatus for loading bags with articles, such as rolled newspapers, comprised of a platform, a retainer means for holding a bag supply relative to an air stream, and a blower having an outlet spaced apart from the retainer means. The bag supply is affixed to a bag supply pad which also serves as a baffle for directing air from the blower outlet into the uppermost bag so as to cause the bag to be inflated, whereupon the article can be inserted thereinto, and the bag then torn from the bag supply pad.

3,673,768

JACKETED PRECIPITATOR APPARATUS

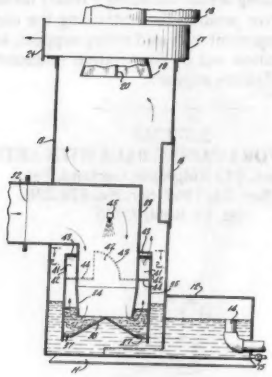
Gerald D. Leonard, Millstone, N.J., assignor to Research-Cottrell, Inc., Bridgewater Township, Somerset County, N.J.

Continuation of Ser. No. 607,839, Jan. 6, 1967, abandoned. This application Oct. 17, 1969, Ser. No. 869,447
Int. Cl. B03c 3/01
U.S. Cl. 55—135 **1 Claim**



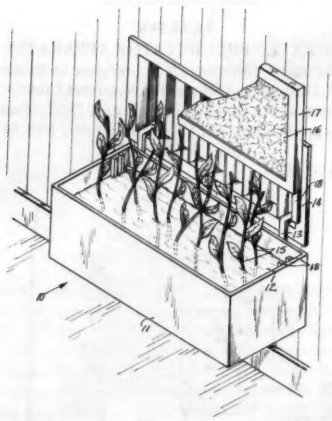
An improved electrostatic precipitator having a temperature regulated precipitator chamber for the treatment of particle-laden gases.

3,673,769
GAS SCRUBBER
Thomas G. Gleason, Manhasset, N.Y., assignor to Combustion Equipment Associates, Inc., New York, N.Y.
Filed July 17, 1970, Ser. No. 55,711
Int. Cl. B01d 47/00
U.S. Cl. 55—223 7 Claims



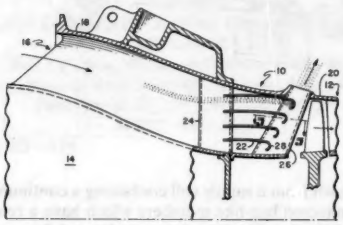
A gas scrubber in which the entering gas is driven through a turbulent bed of water and impinges on a submerged baffle to aspirate the gas and water upwardly through slots which impart a cyclonic flow to the water-entrained gas to effect a spinout of the solids which collect in the surge tank and the cleansed gas is discharged. The need for the usual pump for re-cycling water to provide scrubbing actien is eliminated.

3,673,770
FURNACE REGISTER HUMIDIFIER
Opal B. Novak, 4148 West Maryland Avenue, Phoenix, Ariz.
Filed Dec. 7, 1970, Ser. No. 95,459
Int. Cl. B01d 50/00
U.S. Cl. 55—234 3 Claims



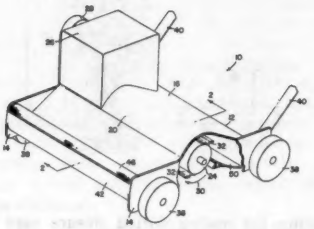
A device resembling an ornamental planter which is provided with hooks to depend it from a furnace register. The device includes water and plants of an artificial nature the plants having a wick-like surface on the rear which will put moisture into the air which is expelled from the furnace register.

3,673,771
MULTI-CHANNEL PARTICLE SEPARATOR
Thomas A. Dickey, Westport, Conn., assignor to Avco Corporation, Stratford, Conn.
Filed Nov. 23, 1970, Ser. No. 91,820
Int. Cl. B01d 46/48
U.S. Cl. 55—306 7 Claims



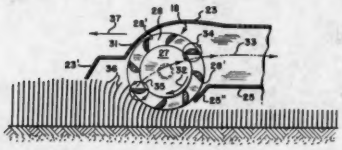
A multi-channel particle separator for separating and removing foreign particles from engine inlet air is disclosed. The multi-channel particle separator utilizes a plurality of concentric catching rings mounted in the air inlet passageway. The leading edge of each ring is mounted to the air swirl vanes. Each trailing or catching portion of the rings is connected with struts which serve as particle scavenge vanes and air deswirl vanes.

3,673,772
IMPACT MOWING MACHINE
Don Earl Holzhei, Reese, Mich., assignor to Deere & Company, Moline, Ill.
Filed Dec. 17, 1970, Ser. No. 99,142
Int. Cl. A01d 45/30
U.S. Cl. 56—13.1 18 Claims



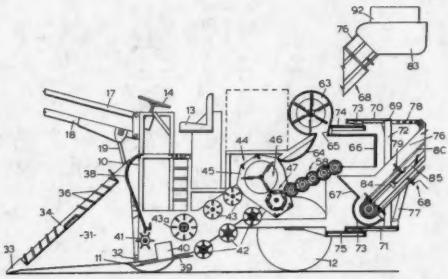
A cylindrical mower rotor has a pair of blades fixed along diametrically opposite sides thereof and the rotor is transversely and horizontally mounted in a fore-and-aft extending housing. The rotor is driven such that the blades are moving forwardly when they reach the lower portion of their path of travel. The blades are angled to cause air to be drawn in through a duct in the forward end of the housing and the duct is so shaped and located that the air discharging therefrom creates a vacuum which lifts the grass just forwardly of the cutting blades at the lower portion of their path of travel. The lower surface of the duct includes a portion which is lower than the cutting height of the mower and which serves to bend the grass into a dense mat to prevent objects from being thrown from under the housing by the mower blades.

3,673,773
CROSS-FLOW MOWING MACHINE
Hugo S. Ferguson, Averill Park, N.Y., assignor to Reel Vortex, Inc., Paestenkill, N.Y.
Continuation-in-part of Ser. No. 699,596, Jan. 22, 1968, abandoned. This application Dec. 12, 1968, Ser. No. 783,192
Int. Cl. A01d 35/24
U.S. Cl. 56—13.3 33 Claims



A cylindrical reel having a plurality of spaced blades is horizontally mounted on a carriage. The reel is driven at high speed about its axis and the outer leading edges of the blades are sharp. A blower conduit cooperates with the reel. The reel, the speed of rotation and the blower conduit are designed to form a blower of the cross-flow type. Vortex action around the leading blades of the reel bend the grass toward the cutting edges of the blades to yield effective mowing, and the cut grass is discharged through the blower conduit. Reel, blade and housing features promoting satisfactory operation are described.

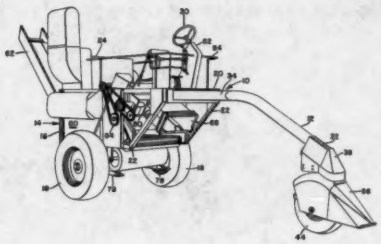
3,673,774
CANE HARVESTER
Joseph Michael Mizzi, Halifax Road, Ingham, Australia
Filed Nov. 23, 1971, Ser. No. 201,359
Int. Cl. A01d 45/10
U.S. Cl. 56—13.9 6 Claims



A sugar cane harvester has cutters for removing cane tops and cutting the stalks which are conveyed to a chopper having a bladed and a slotted rotor interacting to cut the stalks into billets and deliver them to a cane cleaner of toothed parallel rotating drums which tear leaf from the billets and discharge them to an elevator, on which they are carried over parallel screws, alternate screws being oppositely wound and oppositely rotated, for pulling leafy matter from the billets before the billets are discharged from the elevator.

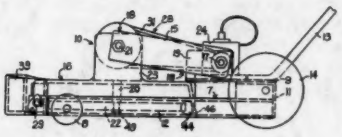
3,673,775
SELF-PROPELLED AGRICULTURAL MACHINE
Frank D. Lloyd Jones, Moline, Ill., assignor to Deere & Company, Moline, Ill.
Filed Oct. 23, 1970, Ser. No. 83,434
Int. Cl. A01d 45/02
U.S. Cl. 56—14.7 9 Claims

A self-propelled machine in which the basic frame comprises a two-wheeled rear traction section and a front arched or "gooseneck" section supported on steerable wheel means



and capable of mounting a variety of crop-handling and harvesting means.

3,673,776
ROTARY BLADE APPARATUS
James I. Smith, 232 County Road, Tenafly, N.J.
Filed April 20, 1971, Ser. No. 135,647
Int. Cl. A01d 35/26
U.S. Cl. 56—16.9 3 Claims

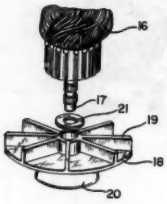


A method is disclosed of pivotally mounting a rotary blade housing on a frame of a rotary blade apparatus which apparatus has a blade shaft adapted to carry a rotary blade and is rotatably supported by said rotary blade housing, said rotary blade housing having an open face affording access to said rotary blade for grass or snow and horizontal and vertical positions on said frame in which said open face faces, respectively, downwardly and forwardly and in which said rotary blade apparatus is operative, respectively, as a grass mower and a snow blower, said rotary blade apparatus also having motor means mounted on said frame, a V-belt power train between said motor means and said blade shaft for rotatably driving the latter, said power train including a gear train mounted on said rotary blade housing, said gear train having an input shaft and said blade shaft for an output shaft, said method comprising providing two longitudinally spaced apart pivot axes, one of which is stationary and the other of which is moveable, axially aligning the motor shaft of said motor means with the stationary pivot axis and axially aligning the gear train input shaft with the moveable pivot axis so that the same said V-belt is useable in either position of said rotary blade housing.

3,673,777
BLADE MOUNTING MEANS
Edwin J. Weber, Baltimore, Md., assignor to The Black and Decker Manufacturing Company, Towson, Md.
Filed Sept. 3, 1970, Ser. No. 69,329
Int. Cl. A01d 35/26
U.S. Cl. 56—17.5 2 Claims

A coupling assembly for attaching a plastic part to a metal shaft, such as a blade holding hub to an electric motor shaft in a grass trimming device. The coupling comprises a plurality of

knurled portions spaced along the shaft at the location of the plastic part. The plastic part is provided with a bore equal in diameter to that of the shaft and is press fitted over the shaft so that the knurled portions compress the plastic. The portion of



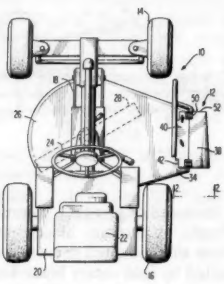
the plastic which passes beyond the knurled portions and between the knurled portions returns via elastic cold flow to a diameter less than that of the knurled portions so that the plastic part is axially locked by multiple surfaces.

3,673,778

WINDROW ATTACHMENT FOR MOWERS

Leslie C. Ramey, Route 7 Liberty Church Road, Macon, Ga.

Filed May 11, 1971, Ser. No. 142,140
Int. Cl. A01d *35/02*
U.S. Cl. 56—320.2 **7 Claims**



The attachment includes a generally inverted L-shaped member having a horizontally disposed base portion hingedly mounted along its free edge to a bracket secured to the mower housing adjacent the clipping discharge opening. The opposite edge of the base portion carries a depending flange or baffle which angles laterally outwardly from the forward to the rear end of the attachment. The attachment is pivotable between a position wherein the baffle lies in horizontal spaced registry from the discharge opening for deflecting the clippings to form a windrow and a second position wherein the attachment overlies the mower housing with the baffle thereof extending substantially vertically upwardly from the base portion permitting non-interference with and free scattering and distribution of the clippings flowing through the discharge opening over the mowed area.

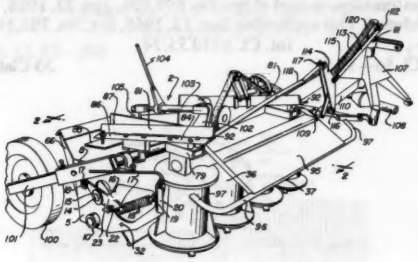
3,673,779

HARVESTING MACHINE

Thomas J. Scarnato, Barrington; Paul C. Grodon, Hinsdale; Stephen R. Hunter, Downers Grove; Paul W. Krage, Elmhurst, and Richard A. Zablocki, Chicago, all of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed April 23, 1970, Ser. No. 31,111
Int. Cl. A01d *49/00*
U.S. Cl. 56—503 **19 Claims**

A mower conditioner comprising disk-type mowers ahead of the conditioning rollers functioning to cut and throw the material directly to the conditioning rollers. Another embodiment utilizes disks which provide unobstructed top surfaces



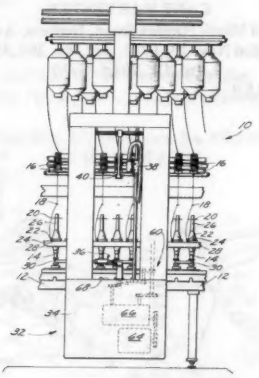
which serve to accept the material and to sling the material rearwardly into the conditioning rollers.

3,673,780

SPINDLE CONTROL MEANS FOR AUTOMATIC YARN PIECING APPARATUS

James K. Merck, Piedmont, S.C., assignor to Maremont Corporation, Chicago, Ill.

Filed Sept. 10, 1970, Ser. No. 70,962
Int. Cl. D01h *15/00*
U.S. Cl. 57—34 R **18 Claims**



Spindle rotation at a spinning frame delivery being serviced by an automatic yarn piecing apparatus is controlled by a rotatable disc member which is pivotably movable about two pivot axes to a plurality of different positions of engagement with and disengagement from a continuously rotated drive wheel and the spindle. Movement of the disc is influenced in various desired ways by biasing means acting thereon and by a cam assembly or other control actuator loosely interconnected to the disc's bipivot mount.

3,673,781

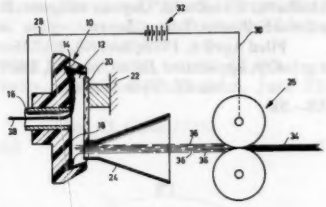
APPARATUS FOR SPINNING YARN

Karl-Heinz Breitenbach, Stuttgart-Bad Cannstatt, Germany, assignor to SKF Kugellagerfabriken GmbH, Ernst-Sachs Str., Schweinfurt, Germany

Filed April 27, 1970, Ser. No. 32,134
Claims priority, application Germany, May 3, 1969, P 19 22 743.1
Int. Cl. D01h *1/12*
U.S. Cl. 57—58.89 **6 Claims**

Yarn spinning apparatus comprising a spinning rotor and

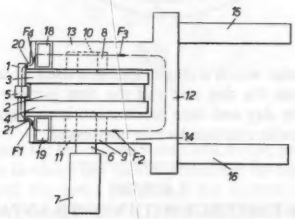
means for feeding fiber slivers thereto. An electrostatic field



being impressed across the fed sliver preferably by employing the rotor and feed means as the respective electrodes

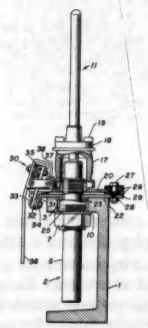
---

3,673,782
MAGNETIC FALSE TWIST SPINDLE
Josef Raschle, Butschwil, Switzerland, assignor to Moulinage & Retorderie De Chavanoz, Chavanoz, France
Filed July 30, 1970, Ser. No. 59,552
Claims priority, application France, Aug. 1, 1969, 69/26460
Int. Cl. D01h 7/92; D02g 1/04
U.S. Cl. 57—77.45 **14 Claims**



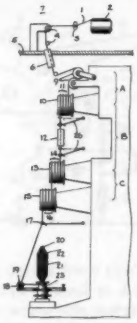
A magnetic false twist spindle comprising a support formed from magnetic material, a single driving roller mounted in this support, at least two magnets located in said support with the poles or associated pole pieces adjacent the periphery of the roller near the axial ends thereof and a spindlette, having a false twist locking means, the spindlette being held in frictional contact with the single driving roller by means of the magnets, the magnetic path being completed by the spindlette and the support.

3,673,783
TEXTILE SPINDLE MOUNTING
Robert W. Timbie, Pensacola, Fla., assignor to Monsanto Company, St. Louis, Mo.
Filed March 10, 1971, Ser. No. 122,711
Int. Cl. D01h 7/08
U.S. Cl. 57—135 **4 Claims**



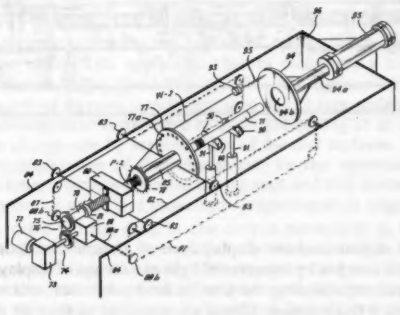
A textile spindle assembly is mounted on a machine rail by means of two correlative supporting plates separated by elastic members with the result that audible frequency vibrations are reduced during operation thereof.

3,673,784
PROCESS FOR CHANGING SUPPLY SPOOLS AND FINISH WOUND COPS ON DRAW-TWISTING AND DRAW-WINDING MACHINES
Fritz Preysch, Winterthur, Switzerland, assignor to Rieter Machine Works, Ltd., Winterthur, Switzerland
Filed June 16, 1970, Ser. No. 46,720
Int. Cl. D01h 9/02
U.S. Cl. 57—156 **6 Claims**



When the supply spool is to be replaced, the thread is severed between the supply spool and delivery mechanism. Next, a fresh supply spool is put in place and the new thread connected to the thread still in the stretching mechanism. Thereafter, the thread is pulled from the rollers below the preliminary stretching zone and brought to the waste cone. After attachment at the waste cone, the machine is started at low speed until the thread connection comes to the waste cone. Thereafter, the machine is accelerated to production speed.

3,673,785
METHOD FOR WIRE-WRAPPING PIPE
Roy H. Cullen, and Charles H. Elliott, both of Houston, Tex., assignors to Youngstown Sheet and Tube Company, Youngstown, Ohio
Continuation-in-part of Ser. No. 592,410, Nov. 7, 1966, Pat. No. 3,481,549. This application Nov. 7, 1969, Ser. No. 874,852
Int. Cl. D07b 1/06
U.S. Cl. 57—161 **3 Claims**



This patent discloses a method for wrapping a plurality of wires about an elongate member in a planetary lay. In one

method the wires are permitted to turn as they are applied to obtain the planetary lay. In the other method the wires are pre-twisted and are held against rotation as they are applied so that they will untwist during application and provide a planetary lay.

3,673,786

TIMEKEEPING DEVICES

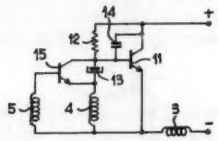
Claude Leyri, Taverny, France, assignor to Jaeger, Levallois Perret, France

Filed Sept. 30, 1970, Ser. No. 76,708

Claims priority, application France, Oct. 2, 1969, 6933575; April 14, 1970, 7013352

Int. Cl. G04c *3/04*; H03b *3/02*

U.S. Cl. 58—28 A **11 Claims**



A timekeeping device is provided with a mechanical oscillator electronically sustained without contact. A balance-wheel bearing permanent magnets induces electromotive force in two coils placed at the point of static equilibrium of the wheel. The electromotive forces are used in an amplifier transistor to supply through a third coil coaxial with the two previous ones a sustaining power, and are further used to control a regulator transistor which acts upon the point of operation of the amplifier transistor in such a way as to vary the power supplied in inverse ratio to the amplitude of the oscillations.

3,673,787

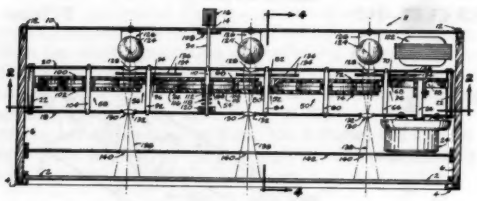
DIGITAL CLOCK MECHANISM

Radoslav Kovacevic, 300 North State Street, Apt. 3406, Chicago, Ill.

Filed March 26, 1971, Ser. No. 128,308

Int. Cl. G04b *19/30*; G03b *21/00*; G04c *17/02*

U.S. Cl. 58—50 R **16 Claims**



A digital read-out display type of electric clock or alarm clock uses back projection of light as a means of displaying numerals representing the time in hours, minutes, and seconds upon a front screen. Means are provided to shut off the light projection when the numerals are altered, and the alteration of numerals is carried out in a fraction of a second.

3,673,788

DAY-DATE JUMPER SPRING IN CALENDAR WATCH

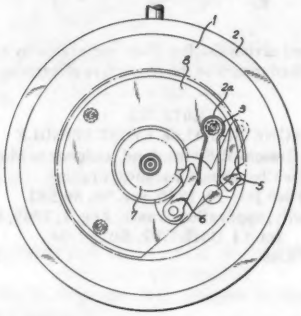
Kazuo Kurihara, Funabashi, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan

Filed April 6, 1970, Ser. No. 25,716

Claims priority, application Japan, April 8, 1969, 44/31357

Int. Cl. G04b *19/24*

U.S. Cl. 58—58 **1 Claim**



In a calendar watch a single spring is used to urge the day jumper against the day star and the date jumper against the date dial. The day and date mechanism is so engineered that the spring can be emplaced while unstressed.

3,673,789

CALENDAR TIMEPIECE WITH MONTH ADVANCEMENT MECHANISM FOR 29, 30, OR 31 DAY MONTHS

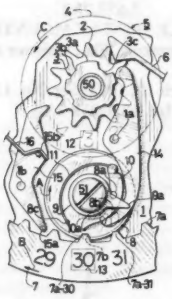
Akira Tsuzuki, and Choken Suzuki, both of Tokyo, Japan, assignors to Citizen Watch Company Limited, Tokyo, Japan

Filed June 11, 1971, Ser. No. 1,521

Claims priority, application Japan, June 13, 1970, 45/51251; Dec. 24, 1970, 45/118312

Int. Cl. G04b *19/24*

U.S. Cl. 58—58 **1 Claim**



A calendar watch comprising a date calendar display dial, a month calendar display dial and a date feed wheel, all being rotatably mounted on the movement of said watch, said wheel being driven by said movement for performing a complete revolution per 24 hours, said watch being characterized by that a spring-loaded pawl means for performing an automatic month end date feed operation to said date display dial is pivotably mounted on said wheel.

3,673,790

ONE-HOUR INCREMENTAL WATCH SETTING DEVICE

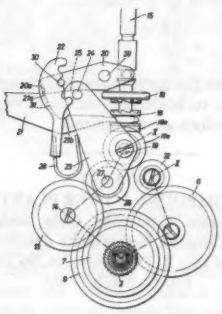
Francois W. Gasser, Bern, and Pierre L. Girard, Biel, both of Switzerland, assignors to Manufacture des Montres Rolex S.A., Bienne, Berne, Switzerland

Filed June 19, 1970, Ser. No. 47,672

Claims priority, application Switzerland, June 23, 1969, 9575/69

Int. Cl. G04b 27/02

U.S. Cl. 58—63 8 Claims



An apparatus for setting the hands of a watch having a three position stem in which the middle position is for adjusting only the hour hand, the outer position is the normal time setting position for adjusting both the minute and hour hands as in a normal watch, and the inner position is the normal winding position.

3,673,791

DEVICE FOR UNIDIRECTIONALLY BLOCKING A RATCHET WHEEL IN A CLOCKWORK MOVEMENT

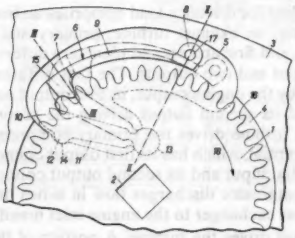
Roland Zaugg, Rebgasse 22, Grenchen, Switzerland

Filed Sept. 14, 1970, Ser. No. 71,986

Claims priority, application Switzerland, Sept. 15, 1969, 13910/69

Int. Cl. G04b 1/16, 3/06, 3/10

U.S. Cl. 58—86 7 Claims



A device for unidirectionally blocking a ratchet wheel, comprising a unique blocking organ having on the one hand retaining means co-operating with stop means formed by stationary parts of a clockwork movement and, on the other hand, a tooth and a disengaging means, both of which co-operate with the toothing of said ratchet wheel, advantages resulting mainly in the automatic mounting of the device.

3,673,792

DEVICE FOR THE MAGNETIC ARRESTING OF A SWITCH WHEEL OF A TIMEKEEPING DEVICE

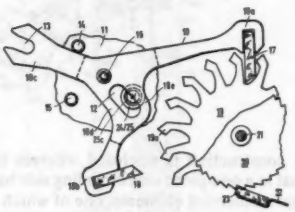
Gunther Scholz, Schramberg, Germany, assignor to Gebruder Junghans G.m.b.H., Schramberg, Germany

Filed March 10, 1971, Ser. No. 122,942

Claims priority, application Germany, March 17, 1970, G 70 09 864.5

Int. Cl. G04c 3/04

U.S. Cl. 58—116 8 Claims



A magnet arresting device for a clock or watch movement including a magnet core housed in a field confining shroud means of magnetically permeable material.

3,673,793

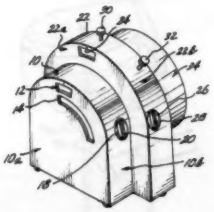
DIRECT CHARGE-RATE INDICATOR

George A. Barnard, III, 12223 Northeast 32nd Street, Bellevue, Wash.

Filed Feb. 25, 1971, Ser. No. 118,889

Int. Cl. G04b 47/00; G07c 1/00

U.S. Cl. 58—152 R 10 Claims

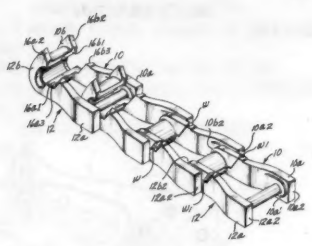


A device for indicating the cost of an operation having at least one charge-rate applicable thereto comprises a compound dial including fixed and movable dial surface which have inscribed thereon logarithmic time and charge scales. A clutch arrangement is provided to allow pre-setting of an applicable charge-rate by manipulation of the dial surfaces. To effect multiplication of that charge-rate by the operation's elapsed time, a timer is included having start and stop controls which provides an output movement proportional to elapsed time. A drive linkage couples this output movement to the movable dial surface so that relative movement between the scales proceeds logarithmically with respect to elapsed time. An embodiment of the device for use as a telephone long-distance call charge indicator is described, including various embodiments of the compound dial and drive linkage therefor.

3,673,794
INDUSTRIAL CHAIN AND METHOD OF MANUFACTURING SAME

Thomas I'Anson, 4014 Hunts Point Road, Bellevue, Wash.

Filed Dec. 16, 1970, Ser. No. 98,661
Int. Cl. B21l *11/00*; F16g *13/18*
U.S. Cl. 59—35 15 Claims

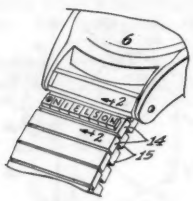


A chain construction is disclosed wherein the individual links are cast in a one-piece unit including side bars, and transverse pivotal connecting elements, one of which in the H-type chain disclosed comprises a shaft and the other a shaft journal sleeve element interconnecting the side bars at the respective opposite ends thereof. The connecting sleeve portion of a link is preformed with an open-sided configuration bendable into closed encirclement around the adjoining link's pivot shaft and the slit edges are welded shut at the sides of the link. A Teflon antifriction bearing pad retained in a wall pocket in the sleeve formation is also disclosed.

3,673,795
EXPANSIBLE WRIST BAND

Lonnie R. Nielson, Las Vegas, Nev., assignor to Carlon Engineering Company, Incorporated, Las Vegas, Nev.

Filed April 16, 1970, Ser. No. 29,003
Int. Cl. F16g *13/24*
U.S. Cl. 59—79 R 11 Claims



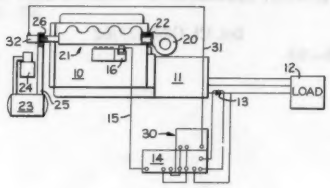
An outer transversely positioned hollow link is formed with an outer opening of less width than the link to receive an ornamental insert that has opposite laterally extending retaining flanges, the retaining flanges of the insert being interposed between the outer wall of the link and a hollow member inside the link.

3,673,796
ANTICIPATING AIR INJECTION SYSTEM FOR TURBOCHARGED ENGINES

Louis F. Weick, Washington, and William F. Linne, Peoria, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed March 3, 1970, Ser. No. 16,133
Int. Cl. F02b *37/04*
U.S. Cl. 60—13 6 Claims

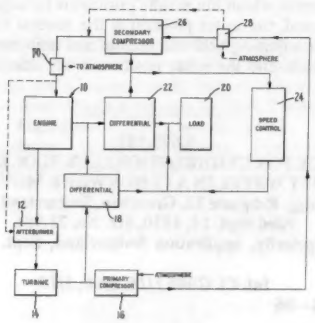
An air injection system for turbocharged engines wherein air is released from a container and injected into the engine manifold in response to a signal representing a change in the magnitude of the load driven by the engine includes a valve means for isolating the turbocharger from the manifold during the time the air is injected and until the pressure in the manifold falls below the turbocharger discharge pressure during which time the turbocharger increases its speed whereby engine speed deviations are minimized.



3,673,797
COMPOUND POWER PLANT

William H. Wilkinson, Columbus, Ohio, assignor to Perkins Services N. V., Curacao, Netherlands Antilles

Filed Dec. 8, 1970, Ser. No. 96,200
Int. Cl. F02b *37/04*
U.S. Cl. 60—13 26 Claims



A power plant for driving a load comprises an internal combustion engine, an exhaust turbine, primary and secondary compressors, and first and second planetary differentials each having an input and two outputs. The first differential has its input driven by the engine output, its first output connected to the load, and its second output driving the secondary compressor. The turbine drives the primary compressor and the second differential, which has its first output connected to the first differential input and its second output connected to the load. The compressor discharges flow in series or in parallel through a heat exchanger to the engine inlet manifold and the engine exhaust drives the turbine. A portion of the net compressor discharge is by-passed around the engine through a heat exchanger to recover heat from the turbine exhaust, and through an afterburner to the exhaust turbine.

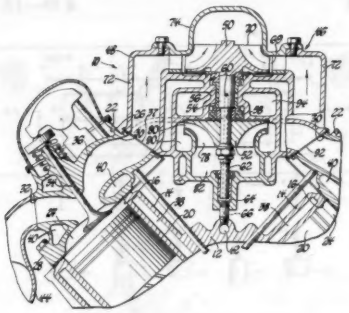
A speed control device connects the second output of the first differential and the load. The speed control device comprises a variable displacement hydrostatic pump driving a variable displacement hydrostatic motor, and a control for the displacements; it may also comprise an electric generator and motor set with a control for the fields.

3,673,798

TURBOCHARGED INTERNAL COMBUSTION ENGINE

Paul B. Kuehl, South Bend, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 8, 1971, Ser. No. 104,866
Int. Cl. F02b 37/04; F02d 39/04
U.S. Cl. 60—13 5 Claims



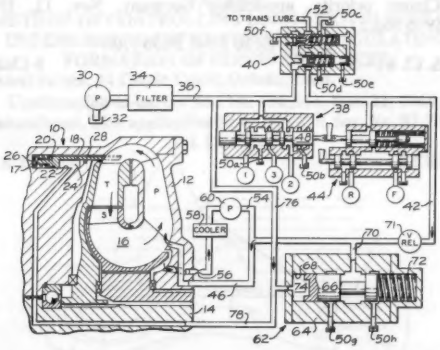
In preferred form, a V-type internal combustion engine is provided with a combination turbocharger and manifold mounted between the cylinder banks in a compact arrangement. Exhaust manifolds on the outer walls of the cylinder banks interconnect the cylinder exhaust passages with the usual exhaust heat passage extending transversely of the cylinder head through which exhaust gases are delivered to the turbine to the central manifold-turbocharger unit. The combination unit provides water cooling and oil lubrication features in addition to a compact and practical construction.

3,673,799

TORQUE CONVERTER MODULATING PISTON

Sidney J. Audiffred, Washington; Lowell E. Johnson, and Shairyl I. Pearce, both of East Peoria, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed March 1, 1971, Ser. No. 119,503
Int. Cl. F16d 31/06, 33/00
U.S. Cl. 60—54 7 Claims



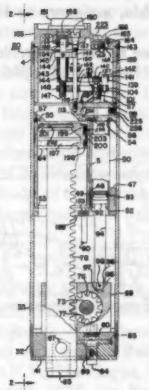
A torque converter used in combination with a multi-speed shiftable transmission is provided with control means which automatically reduces the torque transmitted by the converter at the moment of clutch engagement. The control means includes a dump valve which is responsive to the reduction in clutch engagement pressure to automatically discharge the pressure of the converter while in combination therewith a spoiler ring responsive to the same pressure drop is operative to effect a nearly complete slipping mode in the converter.

3,673,800

HYDRAULIC PRESS

Philip E. Ashton, 749 Yale Avenue, Meriden, Conn.

Filed June 12, 1970, Ser. No. 45,721
Int. Cl. F15b 7/00; A47j 47/02
U.S. Cl. 60—54.5 HA 21 Claims



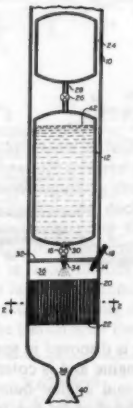
A press having a vertical reciprocating ram actuated mechanically and hydraulically to advance the head thereof. A hydraulic thrusting unit for actuating the ram, removable from the body and comprising a unitary assembly.

3,673,801

PROPULSION METHOD USING CATALYTIC DECOMPOSITION OF HYDRAZINE

Max Goldberger, Wapping, Conn., assignor to Pioneer Research, Inc., Manchester, Conn.

Continuation-in-part of Ser. No. 583,057, Sept. 29, 1966, abandoned. This application Sept. 23, 1968, Ser. No. 761,880
Int. Cl. C06d 5/04
U.S. Cl. 60—218 3 Claims



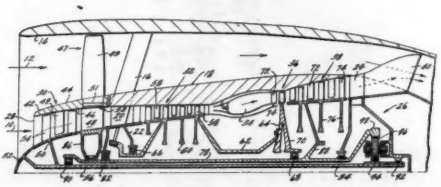
A method is provided for decomposing fuel comprising substantially hydrazine in which the hydrazine is brought in contact with a catalyst consisting essentially of solid porous Raney cobalt. The catalyst may be adheringly supported onto a substrate, such as a foraminous nickel substrate, which has particular use in a propulsion system wherein fuel injected into a

propulsion chamber is caused to contact the catalyst, whereby to decompose said fuel and effectively produce propulsion.

3,673,802
FAN ENGINE WITH COUNTER ROTATING GEARED CORE BOOSTER

James Norton Krebs, Marblehead, Mass., and Peter G. Kappus, Cincinnati, Ohio, assignors to General Electric Company

Filed June 18, 1970, Ser. No. 47,236
Int. Cl. F02k *3/06*
U.S. Cl. 60—226 **5 Claims**

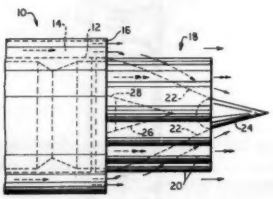


The disclosure describes a turbofan engine having high and low pressure compressors wherein the low pressure compressor, or booster, comprises two counter rotating elements, a rotating duct which carries fan blades on its exterior surface and compressor blades on its interior surface and a conventional compressor rotor which rotates in a direction counter to the direction of rotation of the rotating duct. Alternative gearing schemes for coupling the rotation of the fan to the rotation of the low pressure compressor are shown.

3,673,803
METHOD AND APPARATUS FOR SUPPRESSING THE NOISE OF A FAN-JET ENGINE

Howard R. Macdonald, San Diego, Calif., assignor to Rohr Corporation, Chula Vista, San Diego County, Calif.

Filed Oct. 6, 1969, Ser. No. 863,796
Int. Cl. F02k *1/26*
U.S. Cl. 60—226 R **3 Claims**

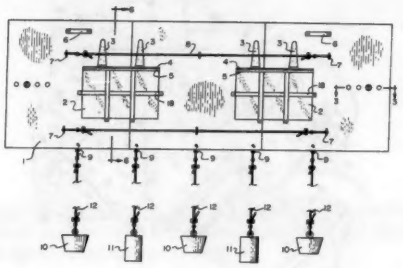


A tubular housing is disposed in spaced relation around the casing of a fan-jet engine and is coterminous with the aft end thereof, fan air of said engine being discharged to the atmosphere through the annular gap between the housing and the casing. A lobed thrust nozzle is mounted on the aft end of the engine casing and extends rearwardly therefrom in coaxial relation therewith. Exhaust gas is discharged through the lobes of the nozzle and thus enters the atmosphere in separate streams spaced apart circumferentially of the aft end of said nozzle, and a portion of the fan air flows between the lobes of the nozzle and into the spaces between the streams of exhaust gas.

3,673,804
OFF-SHORE FIRE AND POLLUTION CONTROL SYSTEM

Frank R. Washburn, 11 North York Street, Houston, Tex.

Filed Feb. 13, 1970, Ser. No. 870,295
Int. Cl. E02b *15/04*
U.S. Cl. 61—1 F **1 Claim**

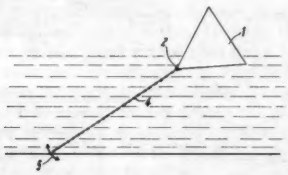


A portable, flexible, floating firewall having a rectangular galvanized metal body and four essentially identical flotation packets, two disposed on each side of the metal body. The flotation packets are formed of Styrofoam and encased in a plastic container which is covered with a layer of asbestos cloth on all exposed portions of the container. A plurality of steel bands secure the flotation packet to the body and an outwardly projecting rigid shelf is mounted immediately above the flotation packet to hold the flotation packet in place. Two horizontally directed cables are anchored near each end of the body on both sides thereof. The cables are adjustable in length in order to control the degree of bending which will be allowed the body. Ballast weights removably connected by cables to the bottom edges of the body continuously urge the body in the upright position in the water.

3,673,805
FLOATABLE BREAKWATER ELEMENT

Bruno Szyfter, Kathe-Dorsch-Ring 12, 1 Berlin, 47, Germany

Filed Nov. 12, 1969, Ser. No. 876,097
Claims priority, application Germany, Nov. 12, 1968, P 18 09 506.2
Int. Cl. E02b *3/06*; **B63b** *7/00*
U.S. Cl. 61—5 **8 Claims**

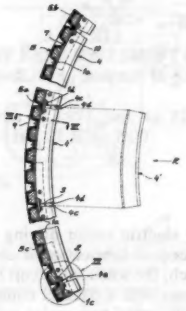


An inflatable elongate prismatic sheet-material shell of triangular profile has a reinforced edge attached to an anchor chain which, together with the shell and the anchor, can be folded into a package in which the sheet material of the shell is wrapped around the anchor and chain. The package, and/or each of its components, is held in a collapsed position by water-soluble bands whereby the anchor slips out of its sheet wrapping when the package is immersed, the shell being then automatically inflated by one or more compressed-air cartridges.

3,673,806
LINER FOR TUNNEL WALL

Siegfried Hanig, and Alfred Langer, both of Peine, Germany, assignors to Firma Ilseder Hutte, Peine, Germany

Filed June 23, 1970, Ser. No. 48,997
Claims priority, application Germany, June 25, 1969, P 19 32 107.4
Int. Cl. E21d 5/08
U.S. Cl. 61—45 R 14 Claims

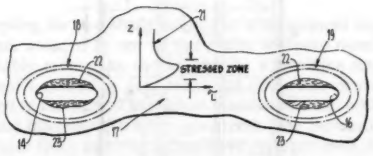


Cylinder segments of plate steel, their junctions bridged by relatively narrow axially extending steel strips welded and bolted thereto, are juxtaposed to form several axially adjoining tubes with interposition of annular reinforcements projecting radially outwardly beyond the tubes to support a protective outer jacket composed of complementary part-cylindrical shell segments. The annular reinforcements consist of complementary arcuate T-profiles with inwardly directed flange portions and complementary flat ring segments overlappingly adjoining the web portions of the T-profiles. The webs of the T-profiles, which are peripherally coextensive with respective cylinder and shell segments, can be cut off along generally radial edges except at two neighboring locations where the edges diverge from the radial direction and are substantially parallel to facilitate radial insertion, in the manner of a keystone, of an intervening shorter segment.

3,673,807
METHOD OF CONTROLLING LONG TERM SAFETY OF UNDERGROUND ENTRY SYSTEM BY REGULATING FORMATION OF STRESS ENVELOPES

Shosei Serata, 14 Calvin Court, Orinda, Calif.

Continuation-in-part of Ser. No. 886,911, Dec. 22, 1969, abandoned. This application Nov. 25, 1970, Ser. No. 92,768
Int. Cl. E02d
U.S. Cl. 61—35 8 Claims

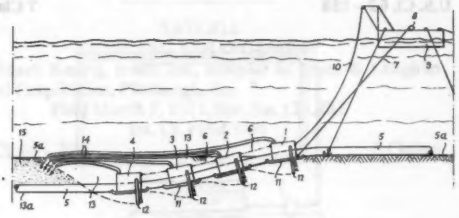


The long term safety of underground rooms excavated in weak ground media which are subjected to large overburden and lateral earth pressures is regulated by controlling the formation of stress envelopes embracing an entry system. Within the entry system the rooms to be protected are placed parallel to the relief openings which are specifically designed to fail. An entry system designed with a predetermined safety period up to infinity is used for making extensive underground excavations safe and economical by supporting the overburden with an orderly development of stress envelopes. In order to create an entry system with a protected room or rooms, two relief openings are first excavated for the purpose of forming primary stress envelopes around the individual relief openings, then one or more protected rooms are excavated between the relief openings in such a manner that the primary envelopes are quickly transformed into a single secondary stress envelope which embraces the entire group of relief openings and protected rooms. A stress relieved zone is thereby created inside the secondary envelope which acts as a stable lining, forming a tubular shield against rock deterioration at the inside boundary of the stress envelope. The envelope supports the overburden and lateral earth pressures. Besides the protection of underground rooms, the stress envelopes may be utilized to control deformation and subsidence of the ground over a mined-out area by creating large protective stress envelopes in the main body of the overburden formation in the same manner as for the protection of underground rooms.

3,673,808
METHOD OF AND APPARATUS FOR BURYING SUB-SEA PIPELINES, CABLES AND THE LIKE

Johan H. Volbeda, Rijswijk, Netherlands, assignor to Nederlandse Maatschappij voor werken Buitengaats (Netherlands Offshore Company) N.V., The Hague, Netherlands

Filed April 6, 1970, Ser. No. 25,747
Claims priority, application Great Britain, April 10, 1969, 18,538/69
Int. Cl. F16l 1/00; E02f 5/02
U.S. Cl. 61—72.4 10 Claims



Pipelines, including cables, are buried in the seabed, which includes the bed of other water covered areas, by a succession of trenching devices travelling along the pipeline one behind the other, the trenching devices each loosening the soil beneath the pipeline and conveying the loosened material from beneath the pipeline to successively increase the depth of a trench beneath it in a continuous and gradual manner whereby the pipeline is laid in the trench at a predetermined depth in a single pass of the trenching devices. The removed soil is used to backfill the trench after the pipe has been laid.

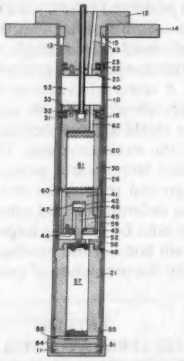
3,673,809
IN-LINE MULTISTAGE CRYOGENIC APPARATUS

Walter H. Bamberg, Stoughton, Mass., assignor to Cryogenic Technology, Inc., Waltham, Mass.

Filed Feb. 10, 1970, Ser. No. 10,228
Int. Cl. F25b 9/02
U.S. Cl. 62—6 7 Claims

Improvement in the construction of cryogenic refrigerators which operate on one of several cycles (Gifford-McMahon, Stirling or Vuilleumier) and in the apparatus of which two or

more displacers, reciprocating within an enclosure define chambers of variable volume. Each of the displacers moves within a separate axially aligned concentric enclosure thereby



making it possible to locate all of the sealing means at a warmer end of the refrigerator and to use a housing of straight cylindrical configuration in place of a stepped configuration.

3,673,810

LIQUID NITROGEN REFRIGERATION SYSTEM

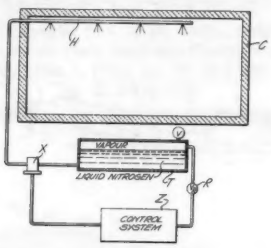
Kenneth Calvert Hales, and Gerald Robin Scrine, both of Cambridge, England, assignors to Shipowners Refrigerated Cargo Research Association, Cambridge, England

Filed Oct. 26, 1970, Ser. No. 83,722

Claims priority, application Great Britain, Oct. 27, 1969, 52,548/69

Int. Cl. F25b *41/04*

U.S. Cl. 62—158 **7 Claims**



The invention relates generally to apparatus for controlling the pressure of fluid supplied from a pressure source to a valve to open and close the valve for predetermined time intervals, the valve preferably being provided in a pipe leading from a supply of liquid nitrogen to the interior of a refrigerated cargo container to condition the interior of the container by supplying pulses of liquid nitrogen for said predetermined time intervals. The apparatus includes a fluidic logic arrangement in a closed loop with a fluidic delay unit, both the fluidic logic arrangement and the delay unit being powered by said pressure source nitrogen vapor and the fluidic logic arrangement has an output port adapted to be connected to the valve, a starter preferably connected to the pressure source to provide a fluidic pressure output starting signal to the fluidic logic arrangement, after which, in a cycle of operations, said fluidic logic arrangement delivers a fluidic pressure input to the fluidic delay unit and an output at said port for opening the valve, the delay unit causing a fluidic output to be delivered to the input of said fluidic logic arrangement after a predetermined time for closing the valve, which output delivered to the input of the fluidic logic arrangement also automatically resets the apparatus continuously to repeat the cycle.

3,673,811

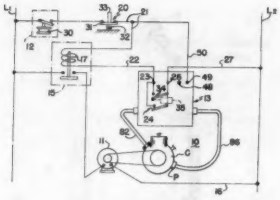
CONTROL DEVICE FOR PRESSURE LUBRICATED COMPRESSORS

Jay C. Adams, and Russell E. Cook, both of Columbus, Ohio, assignors to Ranco Incorporated, Columbus, Ohio

Filed Sept. 15, 1970, Ser. No. 72,464

Int. Cl. F25b *43/02*

U.S. Cl. 62—158 **14 Claims**



Operation of an electric motor driving a refrigerant compressor having forced oil lubrication is controlled by a solenoid operated switch, the solenoid circuit including a thermostatic switch in series with a parallel connected timer switch and oil pressure differential responsive switching means. The timer switch is operated by a relay coil energized by a timing circuit which includes voltage biased switching means having alternate output circuits, one of which includes the relay coil. The switching means is controlled by a capacitor which when charged, causes the timing switching means to change the effective flow of current from one output circuit to the other. In one form of the invention the relay coil is connected in initially energized output circuit of the switching means and is shunted to open the timer switch when the switching means is biased to change energization of the output circuits. The pressure differential responsive switch shunts the timer switch to provide a holding circuit for the solenoid after opening of the timer switch and simultaneously deenergizes the timing circuit.

In another form of the invention, the relay coil is connected in the other output circuit and is not energized for a period determined by charging of the capacitor to a given voltage. In this form the pressure responsive switch does not shunt the timer switch and is effective to deenergize the timer circuit in response to normal oil pressures.

3,673,812

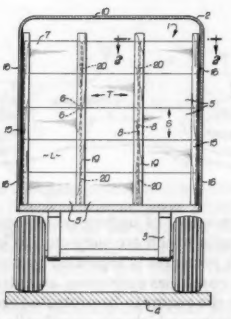
BOXED PRODUCE LOAD

Harold C. Pierce, 234 Mountain View Avenue, Pomona, Calif.

Filed Sept. 28, 1970, Ser. No. 75,975

Int. Cl. F25d *17/04*

U.S. Cl. 62—404 **6 Claims**



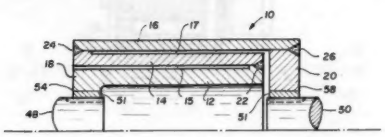
A boxed produce load for refrigerated transport containers having vertically corrugated longitudinal walls defining gas

circulation channels. The boxes are arranged in longitudinal and transverse rows with transverse rows compacted between the longitudinal walls and longitudinally spaced apart opposite a wall channel by means bridging the channel.

ERRATUM

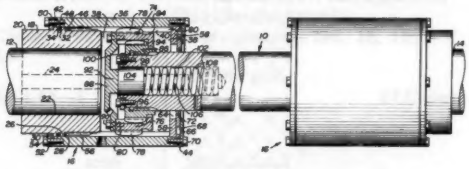
For Class 63—12 see:
Patent No. 3,673,815

3,673,813
TORSIONALLY RESILIENT SHAFT COUPLING
John Wright, Baltimore, Md., assignor to Koppers Company, Inc.
Filed March 12, 1971, Ser. No. 123,666
Int. Cl. F16c *3/00*
U.S. Cl. 64—1 V **16 Claims**



A torsionally flexible shaft coupling for transmitting torque from a driving shaft to a driven shaft includes three radially overlying concentric tube members attached to each other. The attachment with a succeeding concentric member is axially spaced from the attachment with an immediately preceding concentric member for transmitting torque from the driving shaft consecutively through each succeeding concentric member and subsequently to the driven shaft.

3,673,814
GEAR TYPE COUPLING
Kenneth K. Carman, Ellicott City, Md., assignor to Koppers Company, Inc.
Filed Nov. 16, 1970, Ser. No. 89,764
Int. Cl. F16d *3/16*
U.S. Cl. 64—8 **10 Claims**

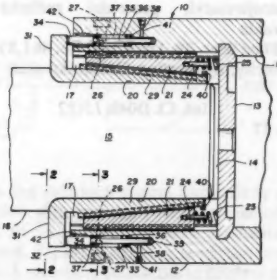


A coupling for two shafts subject to misalignment includes an adapter secured to one of the shafts. A sleeve member is nonrotatably secured to the adapter by a retaining ring and has inwardly extending gear teeth. An outer hub member is positioned in the bore of the sleeve member and has both outwardly and inwardly extending gear teeth. The outwardly extending gear teeth mate with the sleeve member inwardly extending gear teeth and nonrotatably connect the outer hub and sleeve member. The outer hub outwardly extending gear teeth have an arcuate configuration so that the hub member is deflectable angularly. The outer hub member has a shoulder portion that limits angular deflection. An inner hub member is secured to the other of the shafts and is positioned within the bore of the outer hub member. The inner hub member has outwardly extending gear teeth that mate with the inwardly extending gear teeth of the outer hub member to nonrotatably connect the inner and outer hub members. The inner hub member gear teeth have an arcuate configuration so that the inner hub member is deflectable angularly to a limited extent. The outer hub member has a thrust plate enclosing an end portion and a thrust bar within the shaft urges the inner hub member into axial alignment with the outer hub member. The shafts are disconnected by removing the retainer ring and sliding the sleeve member over a shaft away from the adapter. The sleeves of a pair of couplings are also connected to each other to connect a pair of misaligned shafts.

3,673,815
EASILY CLASPED LOCK FOR EARWIRE
Ralph Pintarelli, Greenville, R.I., assignor to Pinta Products, Inc., Providence, R.I.
Filed Dec. 5, 1969, Ser. No. 882,479
Int. Cl. A44c *7/00*
U.S. Cl. 63—12 **4 Claims**

A pierced earring including an elongated bar formed in an open-ended construction having spaced free ends, a substantially U-shaped earwire pivotally connected to the bar adjacent to one of the free ends thereof, the other end of the earwire being removably connected to the bar for mounting of the earring on the wearer's earlobe by insertion through a laterally extending slot formed in the bar.

3,673,816
COUPLING ARRANGEMENT
Alex Mark Kuszaj, Irwin, Pa., assignor to Jones & Laughlin Steel Corporation, Pittsburgh, Pa.
Filed March 5, 1971, Ser. No. 121,282
Int. Cl. F16d *3/06*
U.S. Cl. 64—23 **5 Claims**



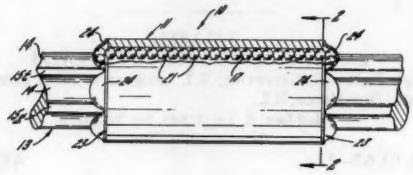
A coupling arrangement for connecting a driving member to a driven member to transfer driving torque to the latter employs opposing wedge elements to lock the members together. The wedge elements function to provide large static clearances between the coupling arrangement and driven member upon their engagement and disengagement, enabling the driven member to be readily changed. At the same time, the wedge elements function to automatically take up the static clearance upon insertion of the driven member into the coupling arrangement, and, in addition, automatically compensate for dynamic clearances occurring during operation of the driven member.

3,673,817

BALL SPLINE ASSEMBLY

Leo F. Doran, Clawson, and Theodore R. Schlenker, Troy, both of Mich., assignors to Beaver Precision Products, Inc., Troy, Mich.

Filed Sept. 23, 1970, Ser. No. 74,691
Int. Cl. F16d 3/06
U.S. Cl. 64—23.7 7 Claims



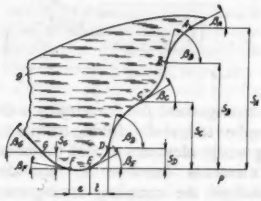
A sleeve and a splined shaft are coupled for rotation in unison and for relative linear movement by trains of anti-friction balls which circulate in pairs of load and return grooves circumferentially spaced from one another around the sized surface of the sleeve. The return grooves are size to receive the balls with free running clearance, and the balls are always in an unloaded or free return condition while traveling in the return grooves, the same grooves serving as return grooves at all times regardless of the direction of rotation of either the sleeve or the shaft. The load grooves are smaller than the return grooves, and the balls in alternate ones of the load grooves are loaded and transmit torque in one direction of rotation while the balls in the other load grooves are loaded and transmit torque in the opposite direction of rotation. If desired, the balls may be sized to fit between the load grooves and the shaft with zero clearance to establish an anti-backlash fit between the shaft and the sleeve. Also, the sleeve may be preloaded on the shaft simply by using balls sufficiently large to be deformed plastically between the load grooves and the shaft.

3,673,818

KNITTING MACHINES

Milan Havranek, Brno; Drahomir Zouhar, Blansko; Josef Dusik, Trebic; Jaromir Kucera, Trebic, and Jiri Krejcirik, Trebic, all of Czechoslovakia, assignors to Elitex-Zavody textilniho strojirenstvi, generalni reditelstvi, Liberec, Czechoslovakia

Filed Sept. 29, 1969, Ser. No. 861,816
Claims priority, application Czechoslovakia, Oct. 2, 1968, 6823/68
Int. Cl. D04b 15/32
U.S. Cl. 66—57 1 Claim



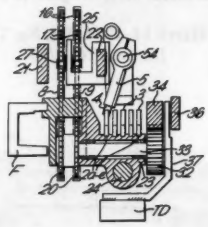
In a knitting machine a cam formed with an edge profile comprising the locus of a plurality of points related to the operation of the machine and joined by a fourth degree curved and having tangential line portions adjacent some of the points producing zero acceleration.

3,673,819

YARN CARRIER DRIVER MEANS FOR VEE BED KNITTING MACHINES

Barry Frederick Swanwick, Melton Mowbray; Ernest West, Kirby-in-Ashfield, and John Harry Cuthbertson, Skegby Sutt, all of England, assignors to S. A. Monk (Sutton-in-Ashfield) Limited, Sutton-in-Ashfield, England

Filed Nov. 6, 1970, Ser. No. 87,434
Claims priority, application Great Britain, Nov. 5, 1970, 55,008/69
Int. Cl. D04b 15/52
U.S. Cl. 66—126 R 9 Claims



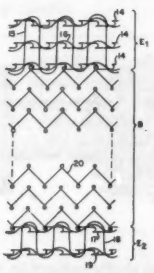
Yarn carrier driver means for vee bed knitting machines having a plurality of yarn carriers and comprising an endless chain assembly for imparting reciprocatory movement to a selected one of said yarn carriers, first adjusting means for adjusting the position of said selected yarn carrier relative to the cams of the cam boxes of the machine, and second adjusting means for reversing the position of said selected yarn carrier at the end of each stroke of said cam boxes.

3,673,820

WARP KNIT PANTY-TYPE GARMENTS

Louis Sarmiento, Hasbrouck Heights, N.J., assignor to International Stretch Products, Inc., New York, N.Y.

Filed March 20, 1970, Ser. No. 21,409
Int. Cl. A41b 9/02
U.S. Cl. 66—177 8 Claims



The invention is directed to a combination fabric of warp knit construction (as distinguished from circular knit, woven, etc.) which is comprised of a body portion having two-way effective elasticity, and integrally knitted, spaced selvedge portions having one-way effective elasticity. The fabric is constructed in a continuous web form, with the elastic selvedges forming the opposite edges of the web. The selvedges are constructed principally of yarns having substantially heavier denier than the yarns principally constituting the body portion. The elastic selvedge portions are constructed to have lateral running yarns imparting the characteristic of substantial non-extensibility to the selvedge portion in the course-wise direction of the fabric. The lateral running yarns of the selvedge are, in addition, of substantially heavier denier than the

warp-wise running yarns of the selvedge, to impart substantial wall rigidity to the selvedge portions, in the course-wise direction, while providing a high degree of flexibility in the warp-wise direction. The body portion of the fabric may be constructed entirely or partly of elastic yarns, or may derive its effective elastic characteristics solely from the knitted construction of the fabric. The fabric of the invention is especially adapted for use in the manufacture of one- or two-piece garments, such as panties or panty girdles.

3,673,821

KNIT GARMENT AND METHOD OF MANUFACTURE

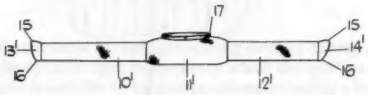
Martin Robert Johnson, Broughton Astley, England, assignor to Prenihan A.G., Chur, Switzerland

Filed Jan. 10, 1969, Ser. No. 790,363

Claims priority, application Great Britain, Jan. 16, 1968, 2,414/68

Int. Cl. A41b *9/02*

U.S. Cl. 66—177 **19 Claims**



A two-legged lower-body garment of the class comprising panti-hose, body stockings, leotards, tights, pantaloons, and pants, is made from a single blank of essentially seamless tubular form throughout knitted on a circular knitting machine and comprising two leg portions and an intermediate pant-forming portion. A waist opening is made in the waist portion; toes may be formed by cutting and seaming, or automatically on the knitting machine. At least the intermediate portion and preferably each portion is knitted of stretchable yarn which may be stretch yarn or elastomeric yarn. If of stretch yarn, the garment may be unboarded but may be given a relaxing treatment.

3,673,822

AN APPARATUS FOR THE CONTINUOUS FINISHING OF KNITTED FABRICS AND HOSIERY GOODS

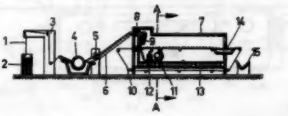
Heinz Fleissner, Egelsbach, near Frankfurt, Germany, assignor to VEPA AG

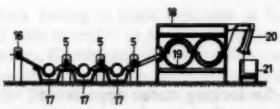
Division of Ser. No. 677,503, Oct. 18, 1967. This application March 19, 1969, Ser. No. 840,861

Claims priority, application Germany, Oct. 18, 1966, V 32144

Int. Cl. D06c *1/06*

U.S. Cl. 68—5 **17 Claims**





An apparatus for finishing, especially bleaching and/or desizing knitted fabrics and hosiery goods, such as for example cellulose fibers, wherein the knitted fabrics and hosiery goods are impregnated with the treatment liquor, steam, washed and/or rinsed and dried. The knitted fabrics and hosiery goods are continuously transported and guided in open width and without any substantial tension during the individual treatment stages.

3,673,823

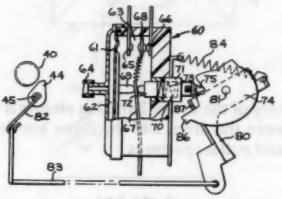
SMALL OR LARGE LOAD AUTOMATIC WASHER

Ved P. Gakhar, Louisville, Ky., assignor to General Electric Company

Filed Feb. 22, 1971, Ser. No. 117,547

Int. Cl. D06f *37/36, 33/02*; F16k *21/18*

U.S. Cl. 68—12 R **5 Claims**



An automatic washer for washing either large or small loads of clothes or other washable articles is provided with a two speed timer for controlling the complete cycle of washing, centrifugal extraction, rinsing the centrifugal extraction operations for either a normal length of time or a shorter length of time. A water level control means for controlling the amount of water introduced into the washer is mechanically connected to the timer means so as to operate the timer on the shorter complete cycle when the water level switch is set for a minimum water level position.

3,673,824

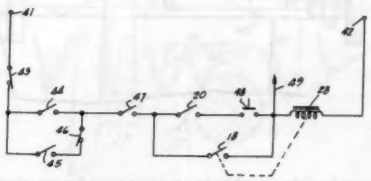
DOOR LATCH AND INTERLOCK

William B. Ripsco, Coloma, and John W. Dietrich, Stevensville, both of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Feb. 23, 1971, Ser. No. 118,124

Int. Cl. D06f *33/02, 39/14*

U.S. Cl. 68—12 R **6 Claims**



A door latch and interlock system particularly adapted for use in connection with laundry equipment including both a door latch and an associated door lock mechanism which is solenoid operated. Separate switches sense the positioning of the lock and latch members, and serve to prevent the machine from being started when the door is not latched, and act as a holding circuit for the push-to-start circuitry.

3,673,825

DRUM MACHINE

Manfred Schuierer, Erbach/Odenwald, Germany, assignor to Bruckner-Apparatebau Michelstadt GmbH, Erbach/Odenwald, Germany

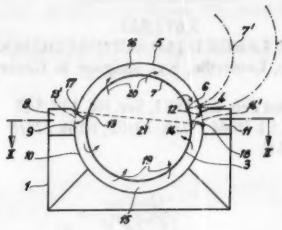
Filed Feb. 1, 1971, Ser. No. 111,259

Int. Cl. F26b *11/04, 21/00*; D06f *35/00*

U.S. Cl. 68—20 **3 Claims**

A perforated drum for receiving textile webs to be treated, is rotatably mounted in a fixed drum housing having air inlet

and outlet apertures which extend over substantially the full length of the drum and are angularly offset from one another



at the periphery of the drum. Partition elements extend across the gap between the drum and the drum housing to separate the air inlet and outlet apertures.

3,673,826

APPARATUS FOR THE FLUID TREATMENT OF FABRICS IN ROPE FORM

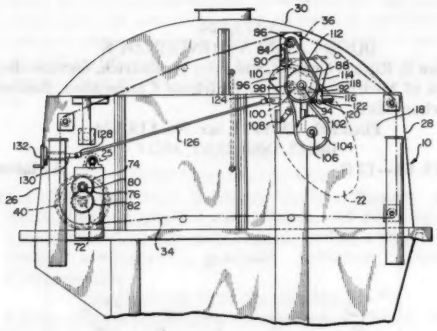
Edward Stanway, Fountain Street, Macclesfield, SK 10 1JW, England

Filed Aug. 20, 1970, Ser. No. 65,448

Claims priority, application Great Britain, Nov. 27, 1969, 57,980/69; Feb. 11, 1970, 6,509/70

Int. Cl. D06f *43/08*; G11b *15/28*

U.S. Cl. 68—176 **12 Claims**



The spiral guide member in an apparatus for treating textile fabrics in rope form of the type wherein a winch roller and a parallel spiral guide member are rotatably mounted lengthwise in a tank with an endless conveyor chain rotatably mounted on the interior of one of the tank end walls and moving in a vertical orbital path around the adjacent ends of the winch roller and the guide member with one end of the fabric being connected to the chain and carried thereby around the winch roller and guide member has its center shaft surrounded by longitudinally disposed rotatable rollers. The winch roller is driven by a prime mover and through a variable speed gearing drives the conveyor chain with such gearing being adjustable by a handwheel at the front of the tank operating a screw through a universally mounted connecting rod to actuate a lever for the gearing so that the speed of the chain is regulated independently of the speed of the winch roller. The chain drives an adjustable speed unit which transmits drive to the spiral guide shaft that is mounted for easy removal from the tank walls with the spiral guide member rotating in timed relation with the rotation of the chain.

3,673,827

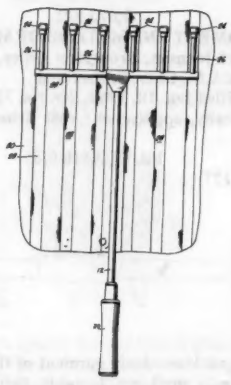
MANUAL STEAMING APPARATUS

John H. Hales, Aurora, Utah

Continuation-in-part of Ser. No. 765,308, Oct. 7, 1968, abandoned. This application June 19, 1970, Ser. No. 47,895

Int. Cl. D06c *1/00*

U.S. Cl. 68—222 **12 Claims**



A novel manual steaming apparatus is disclosed with an improved balanced handle which is offset from the steam delivery tube and affixed axially thereto by a strap which is embedded in the handle. The steaming apparatus employs direct-spray nozzles with openings arranged to give a spray configuration which is inclined to the horizontal sufficient to prevent substantial overlap and interspray condensation, and to effect better steam penetration.

3,673,828

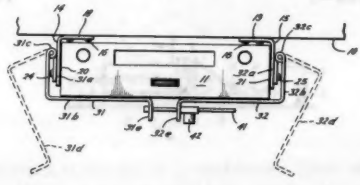
STEREO LOCK

Alton R. Jones, 724 South 13th Street, Nederland, Tex.

Filed Jan. 11, 1971, Ser. No. 105,305

Int. Cl. E05b *73/00*

U.S. Cl. 70—58 **6 Claims**



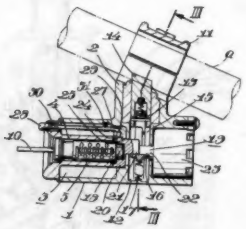
Stereo lock, for locking stereo apparatuses, or the like, in automobiles, or in other locations where such apparatuses may be disposed. The mounting brackets for the stereo units are screwed to the stereo unit, together with hinged members, one at each side of the stereo apparatus, these being pivotally movable to beneath the apparatus where they are locked together by a lock mechanism consisting of a locking slide and a keeper, the latter including a key operated locking mechanism.

3,673,829

THEFT PREVENTING DEVICES IN MOTOR VEHICLES

Tadasi Mizuno, Nagoya, Japan, assignor to Kabushiki-Kaisha Tokai Rika Denki Seisakusho, Nishi-Kasugai-gun, Aichi-ken, Japan

Filed Nov. 25, 1970, Ser. No. 92,764
Claims priority, application Japan, Dec. 6, 1969, 44/98016
Int. Cl. B60r 25/02
U.S. Cl. 70—252 3 Claims



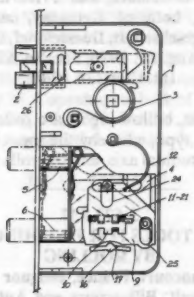
An improvement in theft preventing devices having a rotor lock of the cylinder type by means of which the ignition circuit of a vehicle is settable to various positions including a lock and drive position, and a locking bolt which is protrusible by the rotation of rotor to the lock position to block a vital part of vehicle, in which the improvement lies in that said rotor is not rotatable to the lock position when the rotor is once rotated from the lock position unless a latch means acting on the rotor is manipulated, whereby the accidental locking of the vital part of vehicle during the driving of the vehicle is positively prevented.

3,673,830

SAFETY LOCK

Rene Alfredo Billino, Lope de Vega 135, Saenz Pena, Argentina

Filed Aug. 26, 1970, Ser. No. 67,150
Int. Cl. E05b 25/08
U.S. Cl. 70—352 7 Claims



A safety lock having a latch bolt and at least one key-operated bolt both movable to an unlocking position by turning of a single key. Combination tumbler plates are located on opposite sides of an operating plate connected to the key-operated bolt. The tumbler plates are constructed to be moved to a releasing position, permitting movement of the operating plate, regardless whether the key is inserted from one or the other side of a box in which the elements of the lock are mounted. The key-operated bolt is moved to the unlocking position during turning of the key in one direction and means are provided to move the latch bolt to its unlocking position during further turning of the key in the one direction without further withdrawing the key-operated bolt.

3,673,831

LOCK CYLINDER BODY AND METHOD OF PROVIDING THE SAME

Kenneth R. Nelson, West Vancouver, British Columbia, Canada, assignor to Schlage Lock Company

Filed March 10, 1969, Ser. No. 805,510
Int. Cl. E05b 9/04
U.S. Cl. 70—373 3 Claims

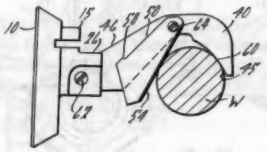
A lock cylinder body is fabricated of a strip of sheet metal with the central portion thereof folded upon itself to define an approximate cylinder and with the end portions extending approximately radially from said cylinder and disposed against each other to define a tumbler tongue in which there are opposed, concave surfaces defining pin tumbler chambers at least partially covered by an integral lip on at least one of the strips. The lock cylinder body is made by bending the central portion of a sheet of strip metal around a cylindrical form until the end portions of the strip are in substantial juxtaposition on opposite sides of a rod projecting radially from the form and then pressing the end portions toward each other until at least one of the end portions deforms around the rod.

3,673,832

CENTERING ATTACHMENT

Bruce D. Bedker, Mt. Clemens, and Frederich C. Wunderlich, Detroit, both of Mich., assignors to Salvo Tool & Engineering Company, Roseville, Mich.

Filed Dec. 9, 1970, Ser. No. 96,357
Int. Cl. B21h 1/00
U.S. Cl. 72—35 17 Claims



Centering attachment for locating a machine component relative to a work piece of circular cross-section irrespective of diameter, including a pair of relatively movable elements adapted to engage circumferentially spaced portions of the work piece, and indicating surfaces on the elements adapted to form a smooth continuous surface when the component is properly spaced from the axis of the work piece.

3,673,833

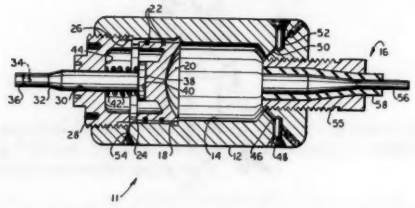
SHOCK WAVE RIVETING MEANS AND METHOD

Gilbert C. Cadwell, Lakeside, Calif., assignor to Rohr Corporation, Chula Vista, Calif.

Filed April 20, 1970, Ser. No. 30,002
Int. Cl. B23p 11/00
U.S. Cl. 72—56 9 Claims

Method and means for upsetting a high strength rivet in a single operation which includes a housing having a cavity for receiving electrically conductive water. A transducer is

mounted on the housing at one end of the cavity and has spaced electrodes defining a gap across which high voltage electrical energy is discharged to generate high velocity shock waves in the water. A piston in the housing at the other end of the cavity faces the transducer and moves in response to the application of shock wave forces transferred thereto through the water. A cavitated anvil is engaged with the upsettable end of a rivet and is moved by the piston to upset the rivet end by



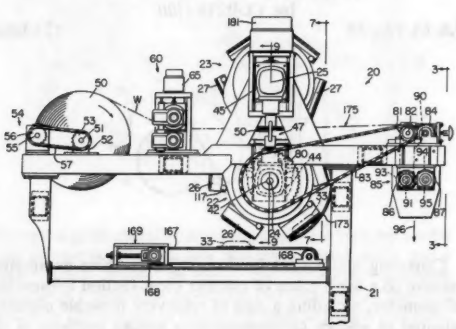
flowing it upon said application of shock wave forces to form a headed enlargement. The several parts of the device are proportioned in size, and weight and mass for dynamic balancing of forces and easy handling by a single worker. The electrical energy is delivered to the transducer by coupling means having high dielectric and strength properties for insuring the safety of the worker.

3,673,834

APPARATUS FOR AND METHOD OF OPERATING ON CONTAINER CONSTRUCTIONS

Hans A. Brunner, Chester, and Geroge B. Vogeleer, Hopewell, both of Va., assignors to Reynolds Metals Company, Richmond, Va.

Filed Oct. 19, 1970, Ser. No. 81,740
Int. Cl. B21d *26/04*
U.S. Cl. 72—57 **21 Claims**



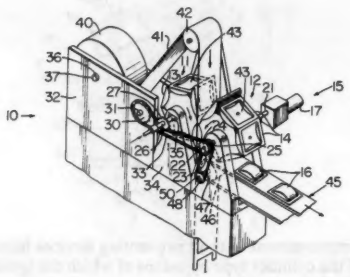
A supporting structure is provided having a pair of wheels each supported thereon about an associated axis of rotation and each of the wheels has a plurality of die halves provided thereon. The wheels are rotated by a drive in a synchronized manner so that each die half of one wheel is arranged opposite an associated die half of the other wheel to provide a plurality of cooperating sets of dies with each set being adapted to operate on a container construction. Mechanical cam means is provided and holds the die halves of each set against opposite sides of an associated container construction over an angular increment enabling a fluid under pressure to be supplied through one of the die halves during such angular increment to operate on the associated container construction.

3,673,835

APPARATUS FOR AND METHOD OF OPERATING ON CONTAINER CONSTRUCTIONS

Horst F. W. Arfert, Richmond, Va., assignor to Reynolds Metals Company, Richmond, Va.

Filed Oct. 19, 1970, Ser. No. 81,739
Int. Cl. B21d *26/04*
U.S. Cl. 72—57 **16 Claims**



A pair of wheels each having a plurality of die halves are rotatably driven in a synchronized manner so that each die half of one wheel is arranged opposite an associated die half of the other wheel to provide a plurality of cooperating sets of dies with each set being adapted to operate on an associated container construction. With the wheels rotating continuously, the die halves of each set are held against opposite surfaces of an associated container construction over an angular increment and during such increment a fluid under pressure is applied through one of the die halves against one of the surfaces of the construction to operate on such construction.

3,673,836

METHOD OF ROLLING HOLLOW STOCK

Ulrich Petersen, Duesseldorf, and Friedrich-Hans Grandin, Muhlheim/Ruhr, both of Germany, assignors to Mannesmann Aktiengesellschaft, Duesseldorf, Germany

Filed Aug. 10, 1970, Ser. No. 62,640
Int. Cl. B21b *19/06*
U.S. Cl. 72—78 **6 Claims**

Continuously cast, hollow ingots are rolled in a rolling mill of the skew rolling type, whereby the ingot is prevented from turning on its longitudinal axis, and the rolls roll on the ingot.

3,673,837

METHODS AND TOOLS FOR FINISHING GEAR TEETH BY ROLLING

Michel Tixier, Billancourt, France, assignor to Regie Nationale Des Usines Renault, Billancourt and Automobiles Peugeot, Paris, France

Filed June 15, 1970, Ser. No. 46,036
Int. Cl. B21h *5/00*
U.S. Cl. 72—102 **4 Claims**

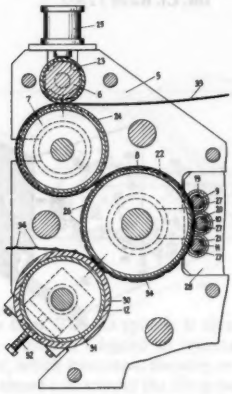
In this method of finishing teeth by rolling, notably gear teeth, the rolling operation known per se of the working surfaces of the teeth is completed by a gauging operation of the inoperative surfaces, that is, those not brought into mutual contact during the gear operation, said gauging operation consisting for example of a flattening of the ridges of the surface uneveness of the rough surface resulting from the milling cutting operation, or a simple contact or an absence of contact, as a function of machining tolerances alone, this method being applicable to the finishing of mass-produced gears, notably in the automotive industry.

3,673,838

CONTINUOUS FORMING OF TRANSVERSE STIFFENING RIBS ON STRIP MATERIAL

Philip George Clempson, Donvale, Victoria, Australia, assignor to Brownbuilt Limited, Nunawading, Victoria, Australia

Filed Jan. 29, 1970, Ser. No. 6,657
Int. Cl. B21d *13/04*
U.S. Cl. 72—187 12 Claims



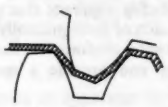
Method of and machine for forming transverse ribs in metal strip wherein the strip is fed through a pair of back tension rolls, over a die roll having a series of elliptical shaped recesses extending transversely of and around the periphery of the die roll, a series of rotary punch rolls engaging the strip on the die roll and deforming the strip into the recesses, a forward tension roll engaging the deformed strip on the die roll and controlling the feed out of strip from the machine, the back tension rolls and the forward tension roll being driven by gearing providing a speed differential between these rolls and thus indicating tension in the strip as it passes over the die roll.

3,673,839

METHOD OF MANUFACTURING A FOIL MATERIAL EMBOSSED ON BOTH SIDES, A ROLL NIP AND A MACHINE FOR CARRYING OUT THE METHOD

Ole Nielsen, 72A, Hellerup, Hellerupvej, and Max Beidil, Sortedam Dossering 25, Copenhagen, both of Denmark

Filed Aug. 11, 1970, Ser. No. 62,850
Claims priority, application Denmark, Aug. 13, 1969, 4344/69
Int. Cl. B44b *5/00*
U.S. Cl. 72—196 7 Claims



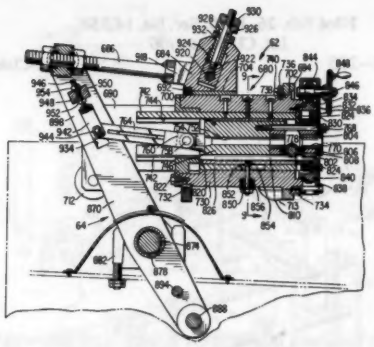
A method for embossing foil material by inserting the foil material in the roll nip between two rolls being provided with projections, each projection of a roll being surrounded on all sides by projections of the other roll, each projection of a roll is axially offset relative to the peripherally adjacent projections on the same roll, the projections of one roll form lines oblique to an axial line and so that the foil material from each projection peak on each roll is stretched to the surrounding projection peaks of the other roll.

3,673,840

COLD ROLLING PIPE ROLLER TYPE ROLLING STAND

Alexandr Ivanovich Tselikov; Vsevolod Vladimisovich Nosal, and Vadim Anatolievich Verderevsky, all of Moscow, U.S.S.R., assignors to Vsesojuzny Nauchno Issledovatelsky and Proektnokonstruktorsky Institute Metallurgicheskogo Mashinostroeniya, Moscow, U.S.S.R.

Filed Jan. 5, 1970, Ser. No. 720
Int. Cl. B21b *17/10*
U.S. Cl. 72—208 36 Claims



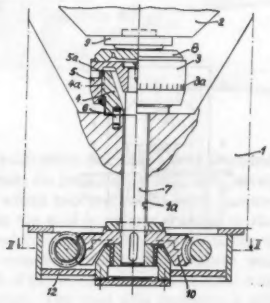
A rolling stand with a reciprocating rigid frame carriage coupled to a vertical rocking beam lever for drive reciprocation. The carriage has eight rollers, cooperating with rigid tracks, disposed to maintain the carriage against pitch. A thick walled rolling reduction head is removably and securely mounted in the carriage. The head contains working rollers maintained in a resiliently biased balanced disposition in a slide race or separator so the rollers bear against former tracks rigidly secured against axial shift in the reduction head. The separator is reciprocable and its movement is synchronized, via a connection to the rocking lever, with the reciprocation of the head so the separator follows the movement of the rollers relative to the head. A wedge mechanism under the former tracks enables radial adjustment of the tracks.

3,673,841

SCREWDOWN DEVICES FOR ROLLING MILLS

Albert Bier, St. Ingbert-Saar, Germany, assignor to Moeller & Neumann GmbH, St. Ingbert-Saar, Germany

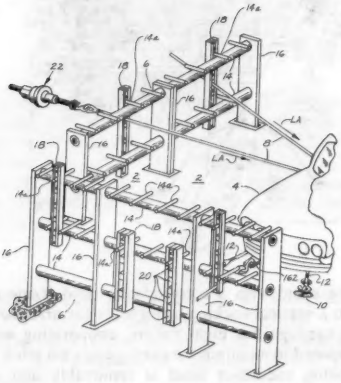
Filed Aug. 28, 1969, Ser. No. 855,460
Int. Cl. B21b *31/24*
U.S. Cl. 72—248 3 Claims



There is disclosed a screwdown device for displacing a chock in a window of a rolling mill frame, wherein two mu-

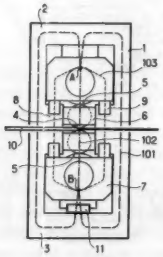
tually meshing screw members are disposed between a transverse member of the frame and the chock, one of the screw members being non-rotatably secured and the other screw member being rotatable by means of a shaft extending through the transverse member, for the purpose of effecting mutually relative displacement of said screw members and thereby the screwdown movement of the chock.

3,673,842
METHOD OF AND APPARATUS FOR REPAIRING DEFORMED YIELDABLE STRUCTURES
Anastacio V. Sanchez, 10775 Foothill Boulevard, Cupertino, Calif.
Filed Feb. 26, 1970, Ser. No. 14,558
Int. Cl. B21d *1/00*
U.S. Cl. 72—293 **12 Claims**



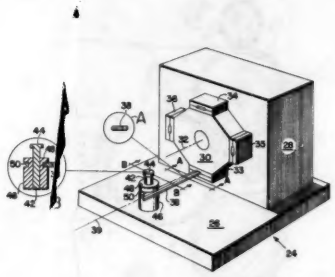
Method and apparatus for repairing vehicle bodies including placing a vehicle body to be repaired within a stall, engaging attachment tools with preshaped contour surfaces to the body about the area to be repaired, joining the tool to tension cable means guided by a select guide means to guide the cable along a desired line of action, and applying tension means to the cable means for placing the cable in tension at adjustable magnitudes along said line of action.

3,673,843
ROLLING METHOD USING PRESTRESSING
Lucien Diolot, Neuilly, France, assignor to Societe Nouvelle Spidem, Paris, France
Filed Oct. 28, 1969, Ser. No. 871,905
Claims priority, application France, Oct. 28, 1968, 68171662
Int. Cl. B21b *31/32*
U.S. Cl. 72—245 **3 Claims**



Process in which the prestress effort does not exceed, in value, that of the residual effort necessary for adjustments during rolling, it being necessary only to block the prestress circuit of the device after the product has been inserted.

3,673,844
METHOD AND APPARATUS FOR SHAPING TEMPLE PIECES FOR SPECTACLES
Berend Heijenga, Norwood, Mass., assignor to Polaroid Corporation, Cambridge, Mass.
Filed Feb. 20, 1970, Ser. No. 13,112
Int. Cl. B21d *11/02*
U.S. Cl. 72—298 **23 Claims**



The subject invention contemplates a process and apparatus for automatically shaping temple pieces used in spectacles. One end portion of a temple piece is rigidly secured by a fixture, the other end portion being unsecured, and rotates therewith so that the movement of the temple pieces generates a cylinder. A spool is rotatably secured to a spindle whose longitudinal axis is generally transverse to the axis of rotation of the temple piece and the spool is provided with an annular recess adapted to receive one end portion of the temple piece.

At one point in the rotation of the fixture, the unsecured end portion of the temple piece is brought into engagement with the annular recess in the spool. Further rotation of the fixture will cause a portion of the temple piece engaging the spool to bend away from the longitudinal axis of the temple piece as it rolls past the spool.

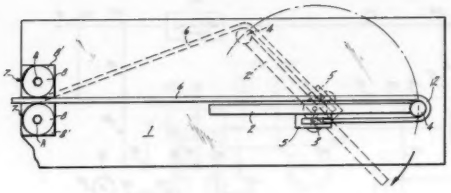
The end portion of the temple piece rolling past the spool is constrained by the annular recess so that it can only move within a single plane at any instant. At the same time, the plane of that portion of the temple piece engaged by the fixture is caused to rotate, due to the rotation of the fixture, so as to effectively twist the end portion of the temple piece, in engagement with the spool, about the longitudinal axis of such temple piece.

The spool may also be slidably secured to the spindle so as to be movable upwardly thereon. By suitably restraining the upward travel of the spool, the temple piece may be caused to bow a predetermined amount between the fixture and the spool. Thus, it is readily apparent that temple pieces may be suitably shaped in each of three mutually perpendicular planes so as to more closely conform to the head shape of the prospective wearer and provide a more comfortable and proper fit therefor.

3,673,845
TENSILE BENDING OF METAL PANELS OR STRIP HAVING INFLATABLE PASSAGEWAYS
John W. Vercoglio, Benld, Ill., assignor to Olin Corporation
Filed Nov. 25, 1969, Ser. No. 879,888
Int. Cl. B21d *11/04*
U.S. Cl. 72—318 **35 Claims**

A process for bonding metal strip or panels containing inflatable passageways, wherein the passageway may be uninflated, partially inflated, preformed, or fully inflated. The strip or panels are eventually fully inflated to form one or more

fluid passageways. The strip or panel is maintained under tension and is bent by contacting it with a die spindle while it is under tension. The strip or panel will be forced ahead and around the die spindle, thus creating elongation. Upon completion of the bend, the strip or panel may be inflated using air, water, or any other inflation medium. The inflation can be accomplished while the strip or panel is still under tension, or they may be freely inflated after removal of the tension. An apparatus for carrying out the process comprises a die spindle shaped to substantially mate with the strip or panel



which is to be bent. The die spindle is secured to a rotatable bending arm, which is adapted to traverse the die spindle through an arc, which intercepts the strip or panel, forcing the strip or panel ahead and around the die spindle. The apparatus also contains means for 4879888X tension to the strip or panel while it is being bent. The tension is preferably slightly less than the yield strength at 0.2 percent offset of the strip or panel. The apparatus is also capable of automatic and continuous operation and is ideally suited to the formation of serpentine-like configurations for use in heat exchangers.

3,673,846

HEAT EXCHANGERS

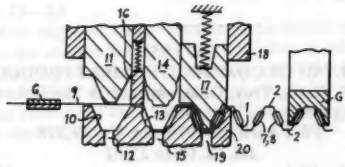
Henry John Levington, and Charles Keith Clark, both of Leamington Spa, England, assignors to Associated Engineering Limited, Leamington Spa, England

Filed April 28, 1970, Ser. No. 32,533

Claims priority, application Great Britain, May 9, 1969, 23,835/69

Int. Cl. B21d *53/04*

U.S. Cl. 72—326 **15 Claims**



This invention relates to an apparatus for producing a heat exchanger fin structure of the type disclosed in FIGS. 1 to 3 of copending U.S. Pat. application Ser. No. 755077. The apparatus comprises means for feeding the corrugated strip forming the fin structure along the direction of the longitudinal plane of the structure to pass restraining means engaging with the corner of an area forming a fin to temporarily restrain or stop the motion of a fin area until at least the next following fin area is inclined towards the restrained area, whereafter the restraining means yield to allow the thus converged fins so formed to pass said means, whereby the resulting corrugated structure has the adjacent fins, extending from either side of a region converging towards each other.

3,673,847

ROUND SOCKET APPLICATOR

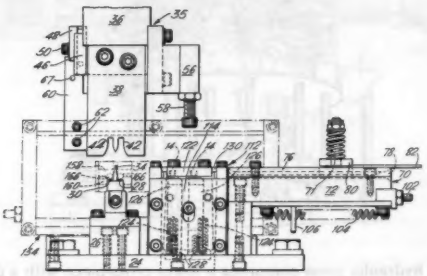
Lodevicus Lambertus Johannes van de Kerkhof, Hertogenbosch, Netherlands, assignor to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 17, 1970, Ser. No. 99,085

Claims priority, application Netherlands, Jan. 7, 1970, 7000181

Int. Cl. B21j *11/00*

U.S. Cl. 72—405 **8 Claims**



Apparatus for crimping a plurality of electrical connectors simultaneously to the ends of juxtaposed wires, the apparatus comprising crimping anvils towards which the strip of connectors is arranged to be fed along a feed path, juxtaposed crimping dies for cooperation with the anvils to crimp the connectors to the wires, a severing device arranged to sever a plurality of the connectors simultaneously from the strip of connectors at a position upstream of the anvils, and feed means arranged to advance the severed connectors simultaneously towards the anvils to position each severed connector on one of the anvils.

3,673,848

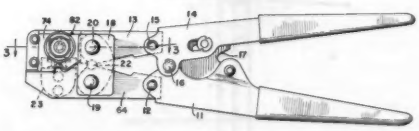
WORK LOCATOR WITH INSULATION ADJUSTMENT FOR CRIMPING TOOL

George J. Filia, Shelton, Conn., assignor to Sargent & Company, New Haven, Conn.

Filed April 21, 1970, Ser. No. 30,389

Int. Cl. B21d *9/08*

U.S. Cl. 72—410 **19 Claims**

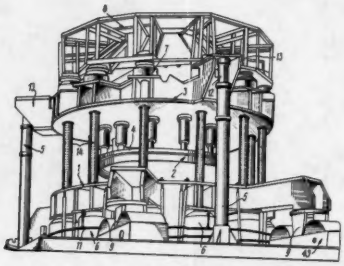


This specification discloses a tool intended for use in crimping terminals on insulated conductors having bared end portions and which tool includes a work locator for positioning a terminal in the tool in proper relation to the dies of the tool, and a bared conductor with respect to the terminal and dies, with the locator including mechanism which accomodates elongation of the terminal and conductor caused by the crimping operation. The tool also includes a crimping die which crimps a portion of the terminal about the insulation and which die is adjustable on the jaw by which it is carried to accommodate insulation of various sizes.

3,673,849
HYDRAULIC PRESS

Bogdan Vyacheslavovich Voitsekhovsky, ulitsa Akademicheskaya, 2; Alfred Alexandrovich Zuev, ulitsa Tereshkovoi, 42, kv. 37; Vladimir Nikolaevich Plaxin, ulitsa Illicha, 14, kv. 65, and Valery Nikolaevich Makarov, ulitsa Barjernaya, 6-a, kv. 36, all of Novosobirsk, U.S.S.R.

Filed Jan. 5, 1970, Ser. No. 727
Int. Cl. B21j 9/02
U.S. Cl. 72—448 7 Claims

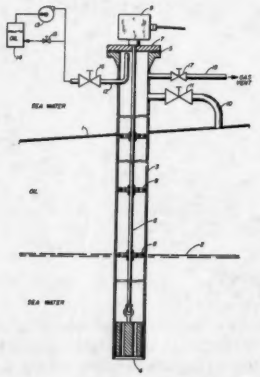


A hydraulic press comprises a lower cross-piece with a die and actuating cylinders mounted on the cross-piece. The piston rods of the cylinders are connected with an upper removable cross-piece by means of nuts of damping devices mounted in the upper cross-piece and the piston rods are articulated in the actuating cylinders serving at the same time as columns of the press. The surfaces of the rods are provided with screw threads and adjustable nuts are threaded therein to elevate the upper cross-piece and to ensure parallel arrangement of the cross-pieces at the end of the working operation of stamping. The lower cross-piece is mounted on bogies for lateral movement relative to the upper cross-piece.

3,673,850
LIQUID LEVEL DETECTOR

Bill S. Burrus, Tulsa, Okla., assignor to Combustion Engineering, Inc., New York, N.Y.

Filed Dec. 3, 1970, Ser. No. 94,758
Int. Cl. G01f 25/00
U.S. Cl. 73—1 R 3 Claims

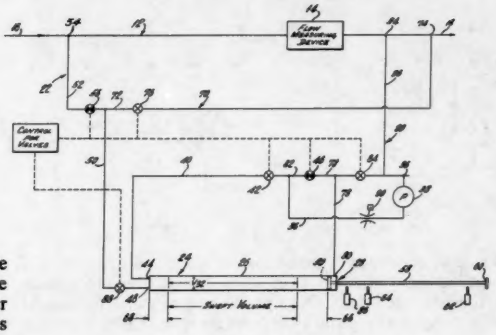


In the environment of a subsea storage tank for petroleum production, a primary element is mounted within a tube extended through the tank top to sense the oil-water interface within the tank. A pump and storage system is connected to the tube to alternately fill the tube with sea water and oil for calibration purposes.

3,673,851
METER PROVING SYSTEM

Edward L. Wright, Plainfield, and Eugene Meseck, Lincoln Park, both of N.J., assignors to Customline Control Products, Inc., Linden, N.J.

Filed Aug. 18, 1970, Ser. No. 64,741
Int. Cl. G01f 25/00
U.S. Cl. 73—3 19 Claims



A system and method associated therewith are disclosed for proving and/or monitoring the accuracy of a flow measuring device situated in an active flow path and capable of providing an indication of the rate of flow of fluid therethrough. The system includes storage means for accumulating a predetermined volume of fluid therein and injection means cooperating with the storage means for introducing said predetermined volume of fluid into the active flow path on the upstream side of the flow measuring device within a measured period of time. In a preferred embodiment, the storage means is continually flushed with the product flowing in the active flow path thereby maintaining the temperature and product in the storage means conincident with the temperature and product flowing in the active flow path. Additionally, fluid derived from the active flow path may be utilized for driving the injection means.

3,673,852
ANALYSIS OF COMMINUTED MEAT PRODUCTS

Kenneth E. Davis, Troy, Ohio, assignor to The Hobart Manufacturing Company, Troy, Ohio

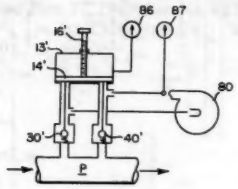
Filed April 16, 1970, Ser. No. 29,278
Int. Cl. G01n 25/02
U.S. Cl. 73—15.4 11 Claims

Rapid determination of fat in comminuted meat products, such as beef and the like, is obtained by exposing a preweighed sample to microwave energy for a period of time sufficient to achieve a relatively constant chemical analysis in the residue. During heating, a substantial portion of the fat is melted, leaves the sample and is collected, while a substantial portion of the moisture is vaporized and released directly as vapor. The sample residue, less released fat and moisture, is weighed as is the collected fat. By cooking the sample using microwave energy to the point short of decomposition of appreciable protein, fat, etc., some fat, moisture and protein and all the ash remain in the residue. Accurate determination of these components may then be calculated because the residue is at a relatively constant chemical analysis.

3,673,853
GAS CONTENT OF LIQUID DETERMINATION

Augustus W. Griswold, Rochester, and James R. Tompkins, Greece, both of N.Y., assignors to Sybron Corporation, Rochester, N.Y.

Filed May 11, 1970, Ser. No. 36,305
Int. Cl. G07n 7/14
U.S. Cl. 73—19 12 Claims



In a continuous liquid carbonation process, a pump draws liquid from a line and pumps it back in again. Periodically, the connections of the pump to the line are shut-off, trapping a sample of carbonated liquid in the pump, which agitates same, causing CO_2 to evolve into a vapor space. Such agitation eventually causes the sample to become an equilibrium mixture of free CO_2 and liquid solution of CO_2. Pressure and temperature measurements on the equilibrium mixture allow calculation of the CO_2 content. The calculation can be carried out automatically and used for automatically controlling the carbonation of the liquid.

3,673,854
METHOD OF OPERATING GAS ANALYSIS APPARATUS

Dan Paul Manka, Pittsburgh, Pa., assignor to Jones & Laughlin Steel Corporation, Pittsburgh, Pa.

Filed July 22, 1970, Ser. No. 57,342
Int. Cl. G01n 31/00
U.S. Cl. 73—23 8 Claims

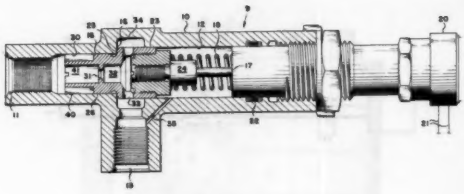
The time required for continuous gas analyzers of blast furnace top gas and the like to reach steady-state conditions after an interruption of furnace operation is greatly reduced by a process including drying the stream of gas analyzed and sealing a gas containing the analyzed constituents within the gas analysis apparatus during the period of interruption.

3,673,855
LEAKAGE FLOW MONITOR

Louis C. Garday, Woodland Hills, and Arthur A. Nemechek, Glendale, both of Calif., assignors to Lockheed Aircraft Corporation, Burbank, Calif.

Filed March 10, 1971, Ser. No. 122,750
Int. Cl. G01m 3/26
U.S. Cl. 73—40 13 Claims

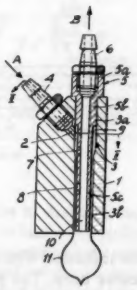
A leakage flow measuring device for hydraulic systems has a body member with a bore interconnecting an inlet and an outlet designed for inline connection in a system. A flow restricting piston is within the bore and moves to a non-flow interfering position in response to operational fluid flow. The piston has a transducer connected to one end and a metering orifice in the opposite end. The metering orifice is of a predetermined dimension which allows fluid up to a predetermined volume to flow therethrough, with the transducer as a function of piston travel. Flow during quiescent periods of a system is indicative of system or component leakage.



3,673,856
FLUID OPERATED SENSOR

Pier L. Panigati, Via Friuli 64, Milan, Italy

Filed March 26, 1970, Ser. No. 22,953
Claims priority, application Italy, Jan. 20, 1970, 19582 A/70
Int. Cl. G01b 13/12
U.S. Cl. 73—37.5 3 Claims

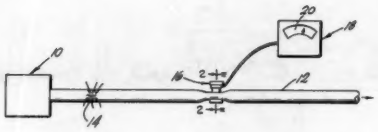


Fluid operated sensor comprising a pipe member having one end open and an opposite end connected to a fluid operated control circuit. An annular nozzle surrounds at least a portion of the pipe member and has an annular orifice surrounding the open end of the pipe member. A pressure fluid input duct connected with a source of pressurized fluid opens into the annular nozzle at a distance from the annular orifice. It conveys a stream of fluid through the annular nozzle and allows the annular orifice to create a fluid jet in a detection direction of the sensor and to determine pressure conditions within the pipe member depending on the fluid jet.

3,673,857
DEVICE FOR DETECTING LEAKS IN VACUUM OR PNEUMATIC PRESSURE LINES

Bernard R. Teitelbaum, Birmingham, Mich., assignor to The Bendix Corporation

Filed Aug. 6, 1970, Ser. No. 61,593
Int. Cl. G01m 3/24
U.S. Cl. 73—40.5 A 9 Claims

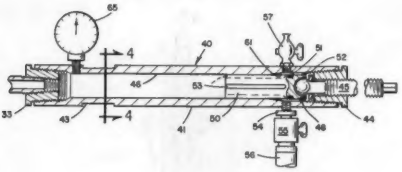


Leak detector apparatus comprising a sensor which can be clamped on a vacuum or pneumatic pressure line to detect the presence of a leak in the line near the clamping location, and an indicator coupled to the sensor to indicate the intensity of signals transmitted by the sensor. The sensor includes a transducer formed of piezoelectric material for transducing to an electric signal the low-amplitude, high-frequency random-force component applied to the clamping surfaces by the turbulence noise which results from the leak. Certain embodiments of the apparatus have a sensor which also includes a mechanical resonator for amplifying the electrical signal that is transmitted.

3,673,858
TUBE TESTING APPARATUS

Charlie D. Miller, Syracuse, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Jan. 29, 1971, Ser. No. 110,986
Int. Cl. G01m 3/28
U.S. Cl. 73—40.5 R 5 Claims

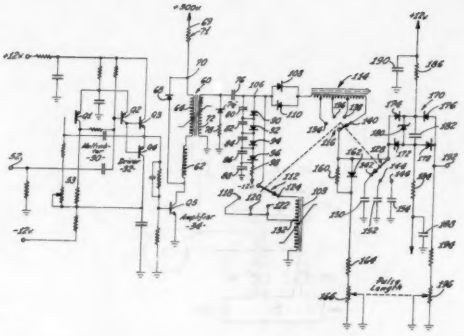


The test pump cylinder is formed with an inner smaller bore merging with a larger outer bore. The piston is dimensioned for close sliding fit with the smaller inner bore. A piston ring is mounted on the outer end portion of the piston and the piston has a greater axial length than the length of the outer enlarged bore, whereby the inner portion of the piston is always positioned in the smaller inner bore. The piston is formed with a passage extending from the inner end thereof and terminating inwardly of the piston ring for communication with the annular space encircling the outer end of the piston when the same is in outermost position. A liquid supply line is connected to the annular space for initially supplying liquid flow through the passage and the inner smaller bore of the cylinder, into the tube under test to fill the same. The piston is moved inwardly moving the piston ring into the inner smaller cylinder bore, to apply pressure on the tube, by a screw threaded in the outer closed end of the cylinder.

3,673,859
MAGNETIC PULSER CIRCUIT FOR MATERIAL TESTER

John W. Couture, Danbury, Conn., assignor to Automation Industries, Inc., Los Angeles, Calif.

Continuation of Ser. No. 794,053, Jan. 27, 1962, abandoned.
This application May 13, 1971, Ser. No. 143,211
Int. Cl. G01n 29/00
U.S. Cl. 73—67.8 R 18 Claims

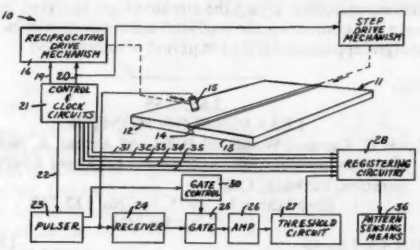


A high voltage magnetic pulser circuit is described which is used, for example, in an ultrasonic nondestructive material testing system. The circuit includes a saturable core transformer which is driven into saturation by the output of a synchronized pulse multivibrator at repetitious intervals. Upon saturation the output voltage on the secondary winding of the transformer has reached a relatively high voltage. Thereafter, the sharp down slope of the voltage creates the leading edge of the pulse and induces a resonant circuit coupled thereto into oscillation. Because of the high level of the signal induced into the resonant circuit from the transformer, the inductor therein also saturates and the trailing edge of the pulse is sharply established. After saturation the resonant circuit is caused to quickly discharge, and thus provide a low impedance to an attached L.C. tuned circuit or the like. The result is a high voltage pulse at a desired frequency.

3,673,860
NON-DESTRUCTIVE TESTING SYSTEM HAVING PATTERN RECOGNITION MEANS

John J. Flaherty, Elk Grove Village, and Henry N. Nerwin, Mount Prospect, both of Ill., assignors to Magnaflux Corporation, Chicago, Ill.

Filed Nov. 10, 1969, Ser. No. 875,304
Int. Cl. G01n 29/04
U.S. Cl. 73—67.9 11 Claims



Non-destructive testing system in which patterns of defects indications, having one or more predetermined configurations, can be indicated rapidly and automatically. Defect indications are registered, preferably in a shift register matrix, and the registered indications are scanned to detect a pattern hav-

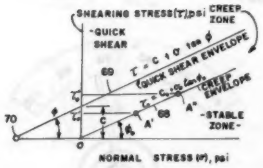
ing a particular configuration, preferably by shifting the indications to a second shift register matrix to which scanning signals are applied. The system is operative to detect any pattern having a particular configuration regardless of its position in the registered indication and the pattern scanning can be carried out simultaneously with scanning of a part. The system may include ultrasonic test means operative in a B-scan mode or a C-scan mode, but other types of non-destructive testing means can be used.

3,673,861

METHOD AND APPARATUS FOR IN SITU MEASUREMENT OF SOIL CREEP STRENGTH

Richard L. Handy, Des Moines, Iowa, assignor to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed June 27, 1969, Ser. No. 837,216
Int. Cl. G01n 3/24
U.S. Cl. 73—101 **9 Claims**



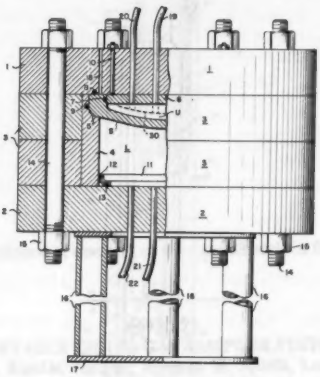
Soil creep rate is measured in situ by lowering a shear testing device into a bore hole and expanding it so that opposing pressure surfaces of the device engage facing surfaces of the bore hole with a constant normal pressure. A force less than that which would exceed the soil shearing strength under the applied normal pressure is then exerted on the device axially of the bore hole to induce a predetermined and constant shearing stress in the soil. A record is made of the deformation of the soil as a function of time for different shearing stresses to generate a family of characteristic deformation curves. The first derivative of each curve with respect to time is the shear rate, which tends to decrease to a substantially constant value with increasing time. This constant shear rate is referred to as the creep rate. A plot of the creep rate against shearing stress yields an empirical value for the creep threshold stress; and a plot of different creep threshold stresses for different values of normal stress defines a stable zone in the shearing stress-normal stress plot.

3,673,862

TRIAXIAL STRESS TEST APPARATUS

Joseph S. Di Crispino, 4030 Raleigh Road, Baltimore, Md., and Leslie M. Kaldor, 25 Sheridan Road, Arnold, Md.

Filed Sept. 25, 1970, Ser. No. 75,595
Int. Cl. G01n 3/10
U.S. Cl. 73—102 **3 Claims**



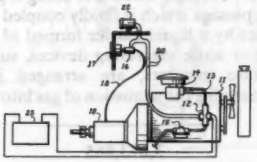
Apparatus for testing spherical tank critical sections exposed to external and internal fluid pressure in which triaxial stresses are induced in full size representative samples of hard structure containments for use in fuel cell applications in deep submergence environments.

3,673,863

FUEL CONSUMPTION INDICATOR

George Ctirad Spacek, 967 La Senda, Santa Barbara, Calif.

Filed Feb. 24, 1970, Ser. No. 888,561
Int. Cl. G01l 3/26
U.S. Cl. 73—114 **6 Claims**



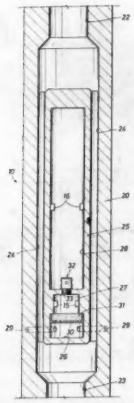
This invention relates to methods and means of measuring fuel consumption of vehicles propelled by combustion engines, and of stationery combustion engines. This invention relates also to methods and means of generating electrical signal in proportion to the speed of the vehicle, particularly sailboats and sailplanes, whether propelled by an engine or not. In the case of stationery combustion engines, the invention relates to methods and means of generating electrical signal in proportion to the flow of the fuel, and utilizing these electrical signals to give the operator instantaneously information about fuel consumption, preferably in gallons per hour, of the engine. In the case of vehicles propelled by combustion engines, the invention relates to methods and means of generating electrical signals in proportion to the speed of the vehicle, and of utilizing these electrical signals to give the operator of the vehicle information about fuel consumption per unit time, preferably in gallons per hour, to give the operator information about fuel consumption per distance travelled, preferably in miles per gallon, and to give the operator information about speed of the vehicle, preferably in miles per hour.

3,673,864

METHODS AND APPARATUS FOR DETECTING THE ENTRY OF FORMATION GASES INTO A WELL BORE

Walter E. Cubberly, Jr., Houston, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Dec. 14, 1970, Ser. No. 97,640
Int. Cl. E21b *47/00*
U.S. Cl. 73—153 25 Claims



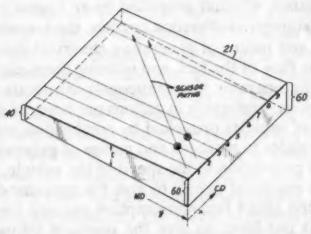
As a preferred mode for practicing the invention disclosed herein, drilling mud in a borehole is fluidly communicated with an enclosed testing chamber by means of a gas-pervious liquid barrier which is at a reduced pressure so that, should there be higher-pressure formation gases dissolved or entrained in the drilling mud, the gases will be drawn through the barrier into the testing chamber. In this manner, by monitoring either the pressure or temperature within the testing chamber, the presence or absence of formation gases in the drilling mud can be ascertained; and, if desired, these measurements can be employed to at least estimate the percentage of gases in the mud sample. In the representative embodiment of the apparatus of the present invention disclosed herein, a tool arranged for coupling into a drill string is provided with a mud-sampling passage which is fluidly coupled to an enclosed testing chamber by a liquid barrier formed of a gas-pervious material. One or more measuring devices, such as pressure and temperature monitors, are arranged in the testing chamber for detecting the admission of gas into the chamber.

3,673,865

METHOD AND APPARATUS FOR ORTHOGONAL VARIABLES

Alfred L. Michaelsen, New York, N.Y., assignor to Westvaco Corporation, New York, N.Y.

Filed April 21, 1971, Ser. No. 136,138
Int. Cl. G01n *33/34*
U.S. Cl. 73—159 10 Claims



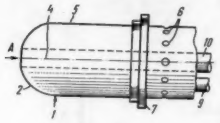
A method and apparatus for indicating a property of sheet of material of substantial width traveling at a high speed. Two sensors for sensing the property are mounted side by side so that they are simultaneously moved across the traveling sheet. The two sensors enable easy differentiation between variations in the cross direction and machine direction.

3,673,866

PITOT TUBE PROBE FOR TAKING TOTAL HEAD AND STATIC PRESSURE OF AIR FLOW

Viktor Borisovich Alperovich, Astakhousky pereulok 1/2, kv. 112, and Alfred Iosifovich Prut, ulitsa Medvedeva, 14, kv. 32, both of Moscow, U.S.S.R.

Filed Dec. 31, 1970, Ser. No. 103,133
Claims priority, application U.S.S.R., Jan. 15, 1970, 1,395,303
Int. Cl. G01p *5/16*
U.S. Cl. 73—212 1 Claim



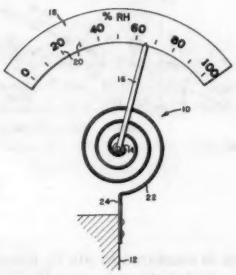
A pitot tube for taking a total head and a static pressure of an air flow. This probe comprises a tip having a streamlined nose surface which is provided with an opening for taking a total head, which surface smoothly transforms into a cylindrical surface provided with an opening for taking a static pressure. The above-said cylindrical surface is equipped with a ring for aerodynamic compensation of the errors appearing during the measurement of the static pressure.

3,673,867

HUMIDITY RESPONSIVE ELEMENT

William F. Cashin, Brooklyn Center, and James R. Mourning, Minneapolis, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 15, 1970, Ser. No. 81,097
Int. Cl. G01n *19/10*
U.S. Cl. 73—337 6 Claims



A humidity responsive element made of a strip of nylon secured to a strip of phosphor bronze. The bi-material element is heated treated after being formed into a spiral to improve the bond and stabilize its response to humidity changes.

3,673,868

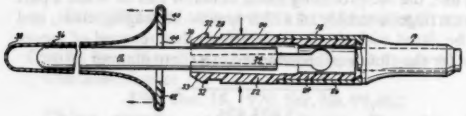
TEMPERATURE PROBE

James Prescott Beury, III, Upper Montclair, and Robert Ernest Burridge, Montclair, both of N.J., assignors to Becton, Dickinson & Company, East Rutherford, N.J.

Filed May 6, 1970, Ser. No. 35,006
Int. Cl. G01k *1/10*, *1/08*
U.S. Cl. 73—343 R 8 Claims

An improved temperature measuring probe is provided, including a sensing element having a probe head attached at the

forward end and a handle connected to the rearward end. The probe is designed for use with an elastic cot designed to fit over the sensing element and to be releasably secured to the handle. To this end a flange extends about the forward portion of the handle. A pair of diametrically opposed slits extend into



the handle from the forward end bisecting the flange. The halves of the flange are normally spaced apart a distance sufficient to engage an annular ring at the open end of the associated cot. Upon the application of a sufficient force, the halves of the flange may be shifted toward one aNother to enable the cot ring to override the flange.

3,673,869

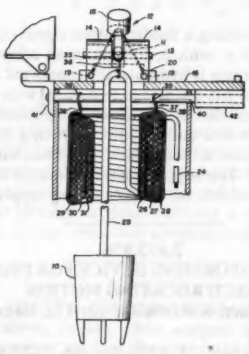
RELEASABLE SUPPORTING APPARATUS

Chester C. Stawarski, 388 Pinehaven Drive, Bethel Park, Pa.; Charles C. Gerding, 728 Gaywood Drive, and Richard T. Adams, 149 Rose Avenue, both of Penn Hills, Pa.

Continuation-in-part of Ser. No. 836,687, June 2, 1969, abandoned. This application Sept. 1, 1970, Ser. No. 68,778

Int. Cl. G01k *1/14, 13/00*

U.S. Cl. 73—343 R **9 Claims**



Apparatus is disclosed for releasably suspending a condition measuring device, such as a weighted or sinker thermocouple, above a steel-refining vessel. The apparatus includes a fusible link, the fusing of which acts to release the device whereby it drops into the vessel. The electrical lead wire of the measuring device is arranged in a controlled bundle for ease of handling and for insuring the smooth pay-off of the wire as the device drops.

3,673,870

TEMP-A-CHECK

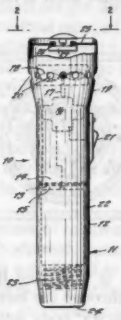
Armand F. Jalbert, 6313 57th Avenue North, Saint Petersburg, Fla.

Filed Oct. 7, 1970, Ser. No. 78,893

Int. Cl. G01k *1/16*

U.S. Cl. 73—349 **4 Claims**

A forced air thermometer for enabling temperatures to be taken accurately and quickly, the device comprising a case containing a motor driven impeller, the motor being in series electrical circuit with a dry cell battery contained within the case and an externally mounted electric switch, the case being provided with a plurality of air openings around the sides thereof in alignment with the impeller, and a thermometer



being positioned at one end of the case directly in front of the impeller.

3,673,871

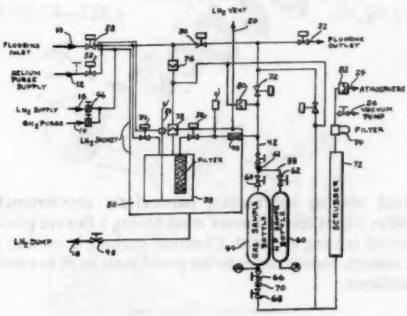
PORTABLE LIQUID GAS SAMPLER SYSTEM

Walter N. Randle, Saugus; Howard H. Spieth, Los Angeles, and William D. English, Orange, all of Calif., assignors to The United States of America as represented by the Secretary of the United States Air Force

Filed June 28, 1971, Ser. No. 157,140

Int. Cl. G01n *1/10*

U.S. Cl. 73—421 R **4 Claims**



A system for removing a liquid gas sample of known volume from a flowing stream and to isolate and separate solid contaminants from the gas including a sample chamber with a jacket for liquid nitrogen to cool the gas and removable sample bottles for laboratory analysis of the gas and associated piping valves and safety valves for the system to function.

3,673,872

CRYOGENIC SOUND SUPPORTED INERTIAL REFERENCE

Donald L. Ensley, San Leandro, Calif., assignor to U.S. Atomic Energy Commission under the provisions of 42 U.S.C. 2182

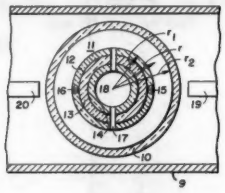
Filed Feb. 1, 1966, Ser. No. 524,044

Int. Cl. G01p *15/00*

U.S. Cl. 73—505 **6 Claims**

An inertial reference unit for sensing rotation about selected axes including a piezoelectric body in a cryogenic chamber. The piezoelectric body is provided with a hollow spherical cavity and is of material of low accoustic impedance. A spherical inertial reference element positioned within the

hollow cavity has optical assymetry and permits passage therethrough of radiant energy in the light spectrum. The space within the cavity outside the reference element is filled with a transmission medium, such as liquid helium. Means are



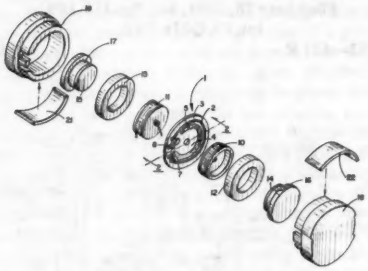
provided for directing at least one light beam through the walls of the cavity and through the inertial element for sensing rotation of the piezoelectric body relative to the inertial element.

3,673,873

SENSING INSTRUMENT HAVING A CANTILEVERED PROOF MASS

Joseph F. Estes, Fullerton, and Imre Kertesz, Placentia, both of Calif., assignors to North American Rockwell Corporation

Filed Oct. 23, 1969, Ser. No. 868,678
Int. Cl. G01p *15/08*
U.S. Cl. 73—517 **4 Claims**



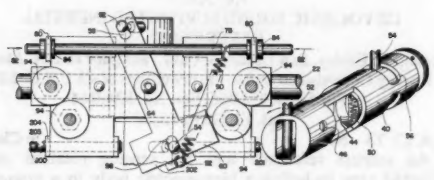
Inertial sensing instrument, particularly accelerometers, that utilize a cantilevered proof mass having a flexure pivot for the inertial sensing element. Chemical etching is used to provide a smooth convex taper to the proof mass so as to establish the cantilever.

3,673,874

RECIPROCATING LINEAR ACTUATOR

Wenzel Zaruba, East Patterson, and Jan Sehnal, Upper Saddle River, both of N.J., assignors to Textol Systems, Inc., Carlstadt, N.J.

Filed June 29, 1970, Ser. No. 50,620
Int. Cl. F16h *21/16*
U.S. Cl. 74—25 **6 Claims**



A reciprocating linear actuator having a housing receiving a tubular member having a lateral opening with a shaft passing through the opening. A plurality of wheels are also mounted in the housing with the wheels being disposed against the shaft for initiating and controlling linear movement of the housing with respect to the shaft that is rotated by the source of power. The housing is made of a special sheet metal construction, and the wheels are urged against the shaft by a single spring in a special novel arrangement.

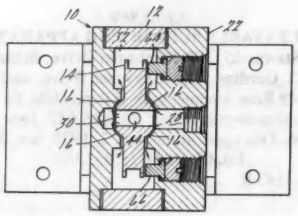
In use, the reciprocating linear actuator can be made a part of a carriage assembly of a therapeutic massaging chair, and can be fitted with shock absorbers so that reversal of movement for the chair can be achieved in a silent manner.

3,673,875

HYDRAULIC RATE GYRO FOR AN ADAPTIVE STEERING SYSTEM

John T. Kasselmann, Southfield, Mich., assignor to The Bendix Corporation

Filed March 19, 1970, Ser. No. 20,962
Int. Cl. G01c *19/52*
U.S. Cl. 74—5.43 **6 Claims**



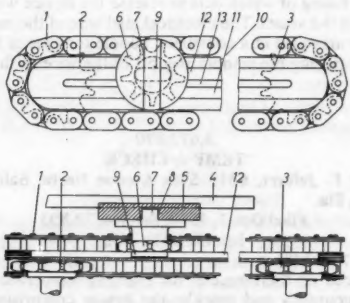
A rate gyro providing a fluidic output signal corresponding to the yaw rate of a vehicle, for use in an adaptive steering system. The gyro rotor is hydraulically supported and spun via tangential reaction jets connected in parallel with flapper nozzles situated to provide both a differential pressure signal corresponding to yaw rate and a centering spring force creating gyro natural frequencies well above the disturbance frequencies encountered. The support, jet, and nozzle fluid supplies are all incorporated into the power steering supply circuit.

3,673,876

MOTION TRANSFORMING DEVICE FOR PRODUCING A RECIPROCATING MOTION

Friedbert R. Rohner, Kukenthalstrasse 12a, Coburg, Bavaria, 8630, Germany

Filed Sept. 21, 1970, Ser. No. 73,783
Claims priority, application Germany, Oct. 25, 1969, P 19 53 829.5; July 18, 1969, P 19 36 757.8
Int. Cl. F16h *19/06*
U.S. Cl. 74—37 **9 Claims**



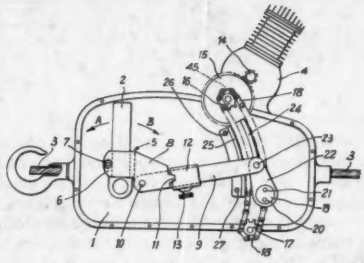
The catch sprocket is driven in an endless path by the upper chain of the double chain while the lower chain is driven about

the two drive sprockets. When the motion direction is reversed, the catch sprocket is moved at a curved end of the endless chains from one guide slot to the other. The travel-to-time curve of the catch sprocket can be shaped in any suitable manner while the reversing time remains of short duration.

3,673,877
POWER OR MANUAL DRIVE CABLE TRACTION APPARATUS

Charles Jean Pierre Lebre, 16 bis boulevard Fleury 91, Viry-Chatillon, France

Filed Dec. 18, 1970, Ser. No. 99,462
Claims priority, application France, Dec. 26, 1969, 6945047; Jan. 1, 1970, 7002397
Int. Cl. G01m *3/02*; B66f *1/00*
U.S. Cl. 74—37 **12 Claims**

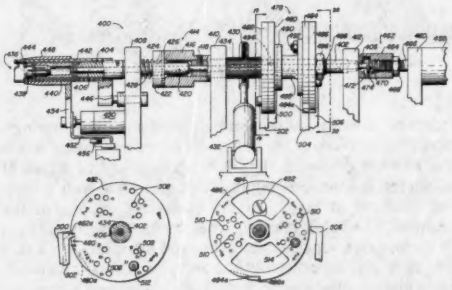


In a cable-pulling device of the type comprising clamps pulling alternately and continuously a cable or rope by means of a mechanism having a driving shaft projecting from the case of the apparatus and provided with a manual control lever, an engine is fitted to the apparatus case and adapted to drive said control lever through a chain carrying a crankpin pivotally connected to an arm releasably coupled to said control lever.

3,673,878
SHAFT ROTATING MECHANISM

John M. Biddison, Dayton, Ohio, assignor to The Globe Tool and Engineering Company, Dayton, Ohio

Filed Dec. 29, 1969, Ser. No. 888,406
Int. Cl. F16d *27/10*
U.S. Cl. 74—125.5 **9 Claims**



The spindle to which an armature is chucked is driven by a drive shaft stopped at plural different predetermined positions by the engagement of stop dogs with cams mounted thereon. In one embodiment there are four cams mounted on the drive shaft for stopping the drive shaft at any one of four positions for winding armatures having two coils per slot. The angular positions of the four cams are pre-adjustable on the drive shaft whereby the predetermined stopped positions thereof can be changed to accommodate different types of armatures and different patterns of wind. Two of the cams are adjustably connected by a sleeve having gear teeth meshing with gear teeth relatively fixed to one of the cams and an eccentric connection to the other of the cams. These cams are rotatable relative to other cams and locked in adjusted positions by pins projecting through apertures therein. The apertures are appropriately marked in terms of the types of armatures and winding patterns.

Two other embodiments of relatively adjustable cams are illustrated. In one embodiment, cams have radially directed slots, portions of which are aligned to obtain the desired angular relation between them. In a further embodiment cams are connected by eccentric pin means used to obtain the desired relative angular positions.

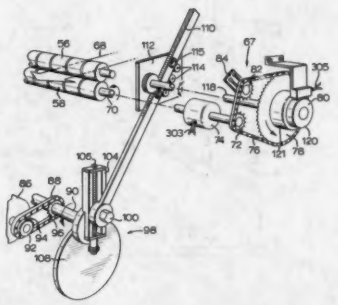
In still another embodiment, only two relatively adjustable cams are used, but with four stop dogs, two of which are angularly adjustable.

The operation of the armature rotating mechanism is described for the winding of both one and two coil per slot armatures. In all embodiments only two of the dogs are used for stopping the armature at predetermined positions for winding armatures having only one coil per slot.

3,673,879
BAG-MAKING MACHINE

Geerardus G. Plate, 2088 Martin Grove Road, Rexdale, Ontario, and Nicolaas Van Hattem, 1168 Homewood Drive, Burlington, Ontario, both of Canada

Filed Dec. 29, 1969, Ser. No. 888,498
Int. Cl. F16d *27/10*
U.S. Cl. 74—125.5 **3 Claims**



A bag-making machine for fabricating bags from tubular, flexible thermoplastic stock material by transversely heat and pressure sealing the stock, advancing a predetermined length of said stock from the machine, and then severing said stock for delivery to a stacking bin while sealing the stock end for initiation of the next bag-making cycle. The machine has a novel draw roller drive, a novel sealer-cutter mechanism, a novel control mechanism and a novel detector for bag jamming.

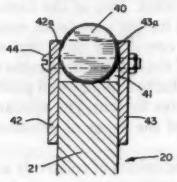
3,673,880
VARIABLE SPEED DRIVE

Joseph T. Faraghan, 600 Arthur Street, Philadelphia, Pa.

Filed Jan. 6, 1971, Ser. No. 104,361
Int. Cl. F16h *15/08*
U.S. Cl. 74—197 **2 Claims**

A variable speed drive has a driving wheel and a driven wheel disposed at right angles to each other, with the circumferential edge of one of the wheels engaging the side surface of

the other wheel. Either wheel may function as the driving wheel; the other then functions as the driven wheel. To change the speed and/or direction of rotation, the position of one of the wheels is changed relative to the other, without disturbing



the right-angle relationship, by moving the axis of rotation of one of the wheels along the diametral plane of the other wheel. The circumferential edge of said one wheel is provided with a series of spaced-apart circular discs portions of which protrude radially from the circumferential edge of the wheel. Each of the discs is mounted for rotation on its own axis, the axis of rotation being tangential, or substantially tangential, to the wheel. The projecting discs engage, or are engaged by, the side surface of the other wheel. When the speed and/or direction of rotation is to be changed by changing the relative positions of the two wheels, the projecting discs which are in engagement with the side surface of the other wheel merely roll on the side surface.

3,673,881

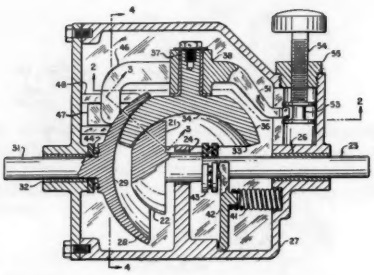
VARIABLE SPEED TRACTIVE TRANSMISSION

John W. Burke, 1715 Bishop Drive, Concord, Calif.

Filed Feb. 3, 1971, Ser. No. 112,277

Int. Cl. F16h *15/08*

U.S. Cl. 74—198 **6 Claims**



A device for transmission of rotary motion by tangential tractive forces accompanying normal forces between rotating solid surfaces wherein the angular velocity ratio between input and output is controlled by varying the positional relationship between contacting surfaces. The device incorporates three main elements herein termed a "ball," a "bowl" and a "ring" therebetween. A rotary mounted bowl has a concave surface facing a convex surface of a rotary mounted ball, with a rotary mounted ring disposed between such surfaces and in contact therewith. The surfaces are urged together so that rotation of ball or bowl is transmitted by tangential tractive forces through the ring to the other. Means are provided to move the ring location for varying the points of contact of same with facing surfaces of ball and bowl to thus control the transmission ratio. The output ratio may be variable between a fraction and a multiple of the input, and input and output shafts may be disposed at the same or opposite ends of the device upon parallel, coincident or non-parallel axes.

3,673,882

ENGINE-DRIVE UNIT HAVING A CONVERTER AND SPEED VARIATOR

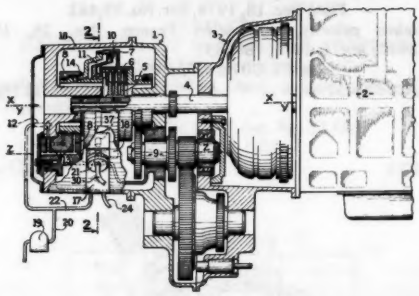
Armand Froumajou, Pontoise, and Bernard Falay, Paris, both of France, assignors to Automobiles Peugeot, Paris, France and Regie Nationale des Usines Renault, Billancourt, France

Filed March 22, 1971, Ser. No. 126,406

Claims priority, application France, Apr. 1, 1970, 70 11 711

Int. Cl. F16h *15/08*

U.S. Cl. 74—199 **4 Claims**



Engine-drive unit comprising a speed variator and a torque converter interposed between the speed variator and the engine. The speed variator includes a fluid motor for pressing the friction elements together, the friction elements being respectively connected to rotate with two shafts one of which is carried by a movable support so as to vary the distance between the shafts. The fluid motor is supplied with fluid under pressure by a supply device controlled by a valve. The valve is controlled not only by the load on the engine but also by the position of the movable support corresponding to the maximum speed reduction.

In this way the force for pressing the friction elements together is limited to the value necessary for good operation of the variator with no loss of power and no useless wear.

3,673,883

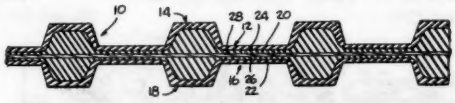
TOOTHED POWER TRANSMISSION BELT AND METHOD OF MANUFACTURING THE SAME

Gerald E. Adams, Mishawaka, Ind., assignor to Uniroyal, Inc., New York, N.Y.

Filed Feb. 3, 1971, Ser. No. 112,325

Int. Cl. F16g *5/16, 1/28;* **B29h** *7/22*

U.S. Cl. 74—233 **11 Claims**



A toothed power transmission belt having teeth distributed on two of the surfaces of the belt and a method of manufacturing the belt are disclosed. The belt is composed of a pair of multi-layered laminations bonded to each other with a reinforcing filament at least partially embedded in one of the laminations. The belt is manufactured by first covering the exterior surface of a longitudinally grooved mandrel with a skin coating of an elastomeric wear and abrasion resistant material. A highly viscous elastomeric tooth filler compound is then applied so as to fill the grooves in the skin coating corresponding to the grooves in the mandrel and cover the entire surface of the skin coating. A reinforcing filament is wound around the mandrel for approximately one-half the width of the covered portion of the mandrel in such a manner as to become at least

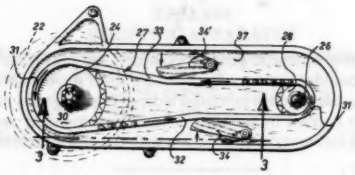
partly embedded in the filler compound. The portion of the elastometric materials not having the reinforcing filament encircling it is reversed upon itself and pulled over the reinforcing filament to form the outer toothed surface of the belt. The entire assembly is then cured, stripped from the mandrel and trimmed. If desired, the resulting finished belt slab may be cut into belts of smaller width.

3,673,884

CHAIN TENSIONING DEVICE FOR SNOWMOBILE TYPE TRANSMISSION

Bertrand Southiere, Valcourt, Quebec, Canada, assignor to Bombardier Limited, Quebec, Canada

Filed Nov. 16, 1970, Ser. No. 89,665
Int. Cl. F16h 7/12, 7/10
U.S. Cl. 74—242.11 S 3 Claims



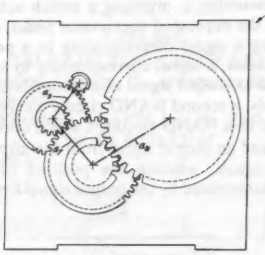
The disclosure herein describes a device for tensioning the endless chain of a snowmobile transmission consisting of a pair of hard wear-resistant members which are connected for pivotal movement to the chain case and engage the opposite outer sides of the transmission chain. The members are spring-biased toward opposite intermediate portions of the chain and operate to tighten the chain, each member alternately operating to take the slack in the chain, in one case when the snowmobile is accelerating and, in the other case, when the snowmobile is decelerating or operating in reverse.

3,673,885

SERIES OF GEAR SPEED REDUCERS

David Hansen, Mortsel, Belgium, assignor to Machinery and Gears Hansen, Edegem, Belgium

Filed Dec. 2, 1970, Ser. No. 94,439
Claims priority, application Belgium, March 11, 1970, 747171
Int. Cl. F16h 1/20, 3/08
U.S. Cl. 74—421 R 18 Claims



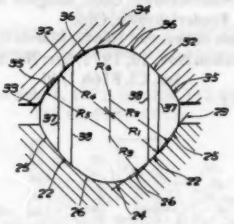
The invention relates to a series of n gear speed reducers with at least n unequal center distances in increasing order, the absolute values of the last center distance of each speed reducer in the series, i.e. of the specific center distances, form an improper geometric progression of which the successive values of the ratio form a geometric progression.

3,673,886

BALL NUT SCREW ASSEMBLY

Tamaki Tomita, Okazak, and Akira Suzuki, Kariya, both of Japan, assignors to Toyoda Koki Kabushiki Kaisha

Filed Dec. 14, 1970, Ser. No. 97,984
Int. Cl. F16h 1/18, 55/22
U.S. Cl. 74—424.8 R 8 Claims



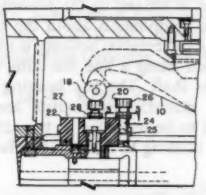
A ball nut screw assembly comprises a screw, a nut, and a train of balls within a passageway formed by the helical grooves in the screw and nut and embraced by a plurality, up to four engaging profiles perpendicular to the helical lead wherein at least one of said engaging profiles is formed by two complex profile portions to produce a moment for righting the ball to its predetermined rolling locus when the ball deviates (runs off) from the locus.

3,673,887

INDEXABLE ADJUSTABLE ABUTMENT

David W. Daniel, Birmingham, and Russell W. Anthony, Harper Woods, both of Mich., assignors to Lear Siegler, Inc., Santa Monica, Calif.

Filed Sept. 23, 1970, Ser. No. 74,701
Int. Cl. F16h 53/00
U.S. Cl. 74—568 R 6 Claims



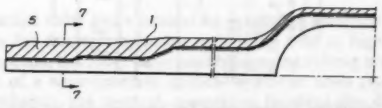
An indexable adjustable abutment having a plurality of independently removable and adjustable abutment elements in the form of headed screws having adjustable stop collars threaded thereto.

3,673,888

AXLE HOUSING

Hans Heinrich Moll, Nusshaherstrasse 7, and Otto Oeckl, Tiflanstrasse 60, both of Munich, Germany

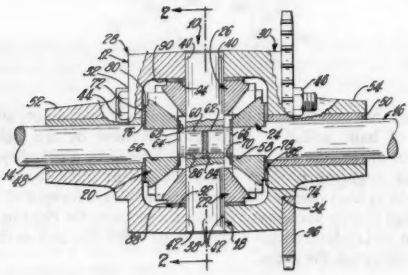
Filed July 23, 1970, Ser. No. 57,717
Claims priority, application Germany, July 23, 1969, P 19 37 288.4; Aug. 28, 1969, P 19 43 730.0
Int. Cl. F16h 57/02
U.S. Cl. 74—607 1 Claim



An axle housing for a motor vehicle is composed of two half cylinders rolled from a flat plate of uniform thickness to varied

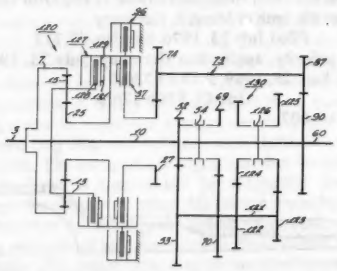
thicknesses from one end to the other, and then die pressed to half cylinder shape and then welded together. This produces a low cost, lightweight housing having adequate strength in the load bearing areas.

3,673,889
DIFFERENTIAL
Hans Hauser, Fredericktown, Ohio, assignor to The J. B. Foote Foundry Co., Fredericktown, Ohio
Continuation of Ser. No. 16,642, March 5, 1970. This application Nov. 10, 1971, Ser. No. 197,539
Int. Cl. F16h *1/40*
U.S. Cl. 74—713 **5 Claims**



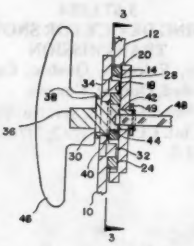
A differential is provided particularly for small self-propelled vehicles or machines such as lawn mowers, which differential is of simplified, sturdy design. Wheel axles within the differential have reduced ends which are received and rotatably supported directly in an idler shaft. These components are assembled prior to mounting the idler shaft in openings of the differential housing to assure proper alignment of the wheel axles and gears. Two miter gears are rotatably supported on the idler shaft and two additional miter gears are affixed to end portions of the wheel axles. A driven sprocket or gear is affixed to the housing which rotates the housing and the components about the common axis of the wheel axles. The differential housing is of two part construction, being joined along a line bisecting the openings which receive the idler shaft. The two housing parts are identical, which reduces manufacturing costs and also enables the driven sprocket to be mounted at two different locations on the differential housing to adapt the differential to particular requirements.

3,673,890
AUXILIARY TRANSMISSION
James W. Crooks, Milwaukee, Wis., assignor to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.
Filed Sept. 3, 1970, Ser. No. 69,260
Int. Cl. F16h *37/08*
U.S. Cl. 74—681 **10 Claims**



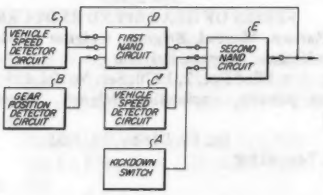
An auxiliary transmission for transmission of power to or from a main transmission to increase the overall speed range of the power gear train in a vehicle.

3,673,891
RECLINING SEAT ADJUSTER
Joseph Pickles, Birmingham, Mich., assignor to Ferro Manufacturing Corporation, Detroit, Mich.
Filed Sept. 14, 1970, Ser. No. 71,844
Int. Cl. F16h *1/28*
U.S. Cl. 74—804 **11 Claims**



Irreversible epicyclic gearing connects the seat back to the seat and includes a manually rotatable shaft having an eccentric portion on which is mounted a drive gear engaged in an internal gear carried by the seat or seat back member and having limited lost motion connection with the other member.

3,673,892
KICK-DOWN CONTROL SYSTEM FOR USE IN AUTOMATIC TRANSMISSION SYSTEM OF AUTOMOBILES
Takaaki Kato, Toyohashi; Mamoru Kawakubo, and Katsunori Ito, both of Kariya, all of Japan, assignors to Nippondenso Kabushiki Kaisha, Kariya-shi, Aichi-ken, Japan
Filed May 11, 1970, Ser. No. 36,003
Claims priority, application Japan, May 28, 1969, 44/41563; June 10, 1969, 44/45526
Int. Cl. B60k *21/00*
U.S. Cl. 74—870 **8 Claims**

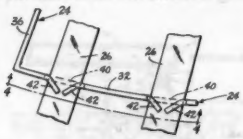


A kick-down control system in the automatic transmission system on automobiles comprising a switch acting to detect the position of the depressed accelerator pedal, a first NAND circuit receiving a signal corresponding to a position of the shifting mechanism, a signal corresponding to a speed of the automobile and an output signal of a second NAND circuit as the input signals, a second NAND circuit receiving an output signal from the first NAND circuit, a signal corresponding to the car speed and an output signal from the afore-said switch as the input signals, wherein the position of the shifting mechanism is determined by the output signal from the second NAND circuit.

3,673,893
METHOD OF MAKING RAKE TINE SUPPORT
William A. Keller, Crestwood, Mo., assignor to Keller Manufacturing Co., Inc., St. Louis, Mo.
Filed Feb. 12, 1970, Ser. No. 10,825
Int. Cl. B21d *53/63*; B21h *7/08*; B21k *11/14*
U.S. Cl. 76—111 **6 Claims**

A rake having a rake tine support bar provided in its manufacture with open slots in which the tines can be laid easily and

rapidly with flanges overlying the tines at right angles and which are adapted to be bent from opposite sides of the slot to a converging or angled relationship to a tine retaining relationship. The bending of the flanges can be automatically effected



in a jig or the like by automatic means insuring a rapid installation of the tines. The converging relationship of the flanges with the rake tine loosely fitting in the slots provides a floating arrangement for the tines to minimize wear and prevent undue strain upon them.

3,673,894

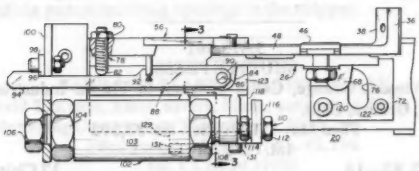
STRIPPING APPARATUS

Harold Jesse Bush, Naples, Fla., assignor to Thomas & Betts Corporation, Elizabeth, N.J.

Filed July 23, 1970, Ser. No. 57,570

Int. Cl. H02g *1/12*

U.S. Cl. 81—9.51 **21 Claims**



The invention is directed to an improved pneumatically operated dual-slide planarly rotatable stripping apparatus. Movably coupled to a base member and rotatable towards and away from a stripping zone adjacent thereto is a first slide member upon which is pivotally disposed a pair of adjoining wire stripper means having a pair of cutter blades movably coupled to one end thereof and a first pair of rollers coupled to the other end and operatively engageable with an appropriately slotted camming portion of a second slide member. A second pair of rollers extending outwardly from the sides of the first slide member engage arcuately slotted adjacent portions of the base member permitting the first slide member to advance and rotate away from the stripping zone, permitting the stripped wire to be simply and accurately linearly advanced from the stripping zone to a subsequent station by appropriate transfer means.

3,673,895

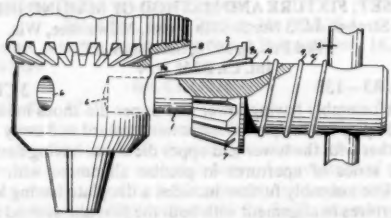
SELF-EJECTING CHUCK KEY

James Des Jardins, Chicago, Ill., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Sept. 16, 1970, Ser. No. 73,046

Int. Cl. B25b *13/44*

U.S. Cl. 81—90 A **6 Claims**



A chuck key having a pilot for insertion in the pilot hole in a chuck body, with a pinion gear for engaging the chuck gear and a T handle has a helical spring portion wrapped around the shank and an extension of the spring extends through a kerf between the teeth of the pinion with a part extending alongside the pilot. When the key is engaged with the chuck the extension of the spring is pushed back into the kerf compressing the spring and when released the spring pushes the key out of engagement with the chuck.

3,673,896

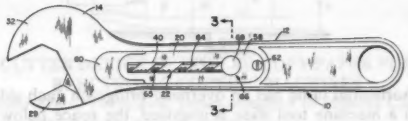
SPIRAL ACTUATED, ADJUSTABLE JAW END WRENCH

Hunter W. Vardaman, Huntsville, Ala., assignor to Mekatron Corporation

Filed Feb. 4, 1971, Ser. No. 112,688

Int. Cl. B25b *13/16*

U.S. Cl. 81—165 **4 Claims**



An adjustable jaw end wrench in which an adjustable jaw is operated by a worm gear, the worm gear is operated by a spiral groove drive, the spiral groove drive is operated by a circular cam riding in the spiral groove drive, and in which a thumb actuated button is rotatably connected to the cam and the button is mounted for reciprocating movement, whereby the movable jaw is opened and closed.

3,673,897

METHOD OF MACHINING A FRICTION ROLLER

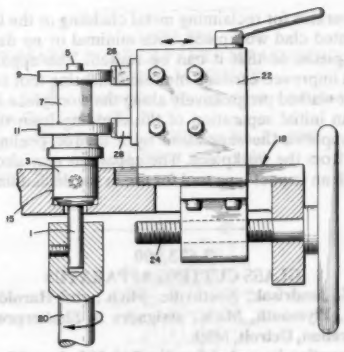
Hans Gassner, Schweinfurt, Germany, assignor to Kugelfischer Georg Schafer & Co., Schweinfurt, Germany

Filed Jan. 5, 1970, Ser. No. 685

Claims priority, application Germany, Jan. 4, 1969, P 19 00 402.5

Int. Cl. B23b *1/00*

U.S. Cl. 82—1 C **3 Claims**



A friction roller and a method for producing a friction roller suitable for driving a spinning or twisting tube at high rotational speeds, the roller having tube-engaging driving surfaces formed of a wear-resistant resilient synthetic resin (such as polyurethane), the method comprising finishing the driving surfaces of the roller by machining them while the roller is being rotated at the maximum expected driving speed, which may be of the order of 30,000 to 40,000 r.p.m.

3,673,898

HORIZONTAL LATHE WITH OVERHEAD BRIDGE

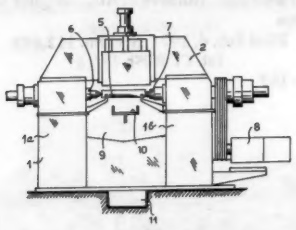
Bruno Bronzini, Turin, Italy, assignor to Fratelli Morando & C.S.p.A., Turin, Italy

Filed June 26, 1970, Ser. No. 50,160

Claims priority, application Italy, Feb. 21, 1970, 67580 A/70

Int. Cl. B23b 15/00

U.S. Cl. 82—2.5 2 Claims



A horizontal lathe has an overhead bridge on each side of which a machine tool slide is disposed, the space below the workpiece being free. A conveyor for workpieces can be arranged in this free space.

3,673,899

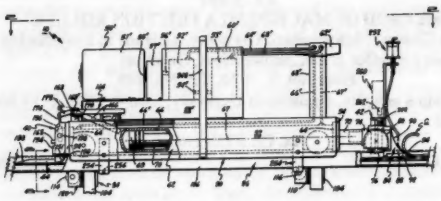
WORKPIECE RECLAIMING APPARATUS

Dietmar G. Plichta, Oakland, Calif., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Dec. 11, 1970, Ser. No. 97,153

Int. Cl. B23d 7/10

U.S. Cl. 83—4 16 Claims



An apparatus for reclaiming metal cladding or the like from an elongated clad workpiece, with minimal or no damage to the workpiece, so that it can be reused. The apparatus includes an improved carriage-mounted shearing tool that is advanced or walked progressively along the workpiece and after making an initial separation of the cladding from the workpiece completes the separation by a unique peeling of the cladding from the workpiece. The apparatus may also be provided with an impact type tool for use in the decladding operation.

3,673,900

GLASS CUTTING APPARATUS

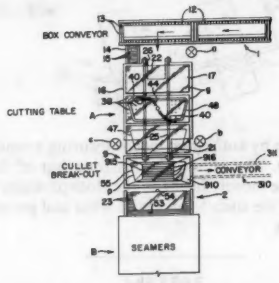
Joseph E. Jendrisak, Northville, Mich., and Harold E. McKelvey, Plymouth, Mich., assignors to Shatterproof Glass Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 740,202, June 26, 1968, abandoned. This application Aug. 10, 1970, Ser. No. 62,596

Int. Cl. B26d 3/08

U.S. Cl. 83—11 35 Claims

An automatic glass cutting apparatus having a table, a template ring supported above the table and having two peripheral cam tracks with curved shapes corresponding to that of windshield panes, motor means for feeding glass sheets to a position below the template ring, a cutter unit mounted to move on the template ring, and having one or more drive rollers engaging said ring, an air motor for driving said rollers to move the cutter rapidly around the ring, a cutting tool for engaging a glass sheet below the template, and a cam follower alternately engageable with one or the other of said cam tracks to locate the cutting tool as it travels around the template. The



cutter unit has a unique construction and includes means for alternately switching the cam follower from one cam track to the other to determine the size of the pane being cut. Means are provided to slow down or deenergize the cutter motor when the cutters approach a sharp turn or approach the stop position.

3,673,901

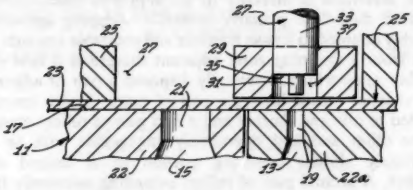
SHUTTLE PRESS

Paul Vinson, Orange, Calif., assignor to Vinson Industries, Inc., Orange, Calif.

Filed May 1, 1970, Ser. No. 33,592

Int. Cl. B26f 1/02

U.S. Cl. 83—14 17 Claims



A press for performing work operations on sheet material and having first and second stations at which such work operations are performed. A shuttle which is part of the press moves back and forth along a predetermined path to index the sheet material through the stations. The press includes a platen and preferably substantially all of the press lies beneath the platen. Although various work operations can be carried out on the press, one of these operations involves impact piercing in which the punch strikes against the sheet material with sufficient velocity to form an aperture therein without entering the die cavity.

3,673,902

DIE SET; FIXTURE AND METHOD OF MAKING DIES

Walter Strobel, 4433 North 68th Street, Milwaukee, Wis.

Filed Feb. 9, 1970, Ser. No. 9,537

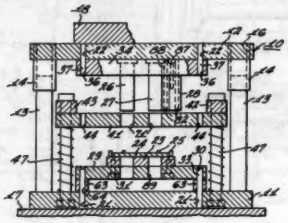
Int. Cl. B26f 1/14

U.S. Cl. 83—133 3 Claims

A die assembly having lower and upper die shoes mounted on guide pins for reciprocal movement toward and away from each other with the lower and upper die shoes having first and second series of apertures in precise alignment with each other. The assembly further includes a die plate having locating apertures in alignment with both the first and second apertures mounted on the lower shoe; a punch plate having locating apertures in alignment with both the first and second aper-

tures mounted on the upper die shoe; and a stripper plate, having locating apertures in alignment with both the first and second apertures mounted on cross bars which in turn are mounted on the die assembly.

The die and punch are precisely mounted in working align



ment on the die plate and punch plate for co-operation with a stripper by the method of placing locating pins in either the first or second apertures and successively placing the die plate, punch plate and stripper on said locator pins for precise machining of the die contour, the punch mounting openings and the punch receiving openings in the stripper.

3,673,903

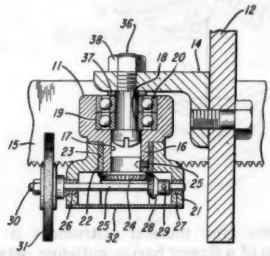
BAND SAW BLADE CLEANING MEANS

David T. Evans, Three Rivers, Mich., assignor to Wells Manufacturing Corporation, Three Rivers, Mich.

Filed June 1, 1970, Ser. No. 42,156

Int. Cl. B23d *59/00*

U.S. Cl. 83—168 **3 Claims**



A rotary brush means adapted to sweep the cutting edge of a band saw blade and driven by a blade guide roller.

3,673,904

MICROTOME ASSEMBLIES

Michael Henry Cooper, Burnley, and Leslie Alva Fryatt, Accrington, both of England, assignors to N.G.N. Limited, Marfleet, Hull, Yorkshire, England

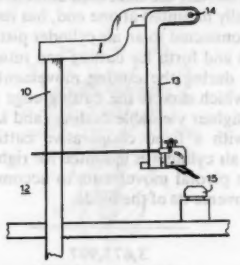
Filed Dec. 14, 1970, Ser. No. 97,536

Claims priority, application Great Britain, Dec. 16, 1969, 61,267/69

Int. Cl. G01n *1/06*

U.S. Cl. 83—171 **9 Claims**

A microtome assembly comprises a pivotally suspended knife assembly and knife displacing means which are coupled to the knife assembly such that forward movement of the displacing means urges the knife assembly into a lower position before horizontal displacement of the knife assembly on its cutting stroke, and retractive movement of the displacing means urges the knife assembly to an upper position before horizontal displacement of the knife assembly on its return stroke. The knife body is therefore lifted clear of a specimen



before its return stroke thereby avoiding damage to a cut surface of the specimen.

3,673,905

CUTTER DEVICE OF ROLLED COPY PAPER FOR ELECTRONIC COPYING MACHINES

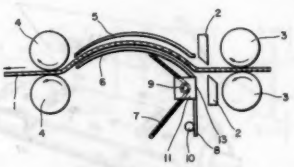
Tateomi Kono, Toyokawa, Japan, assignor to Minoita Camera Kabushiki Kaisha, Osaka, Japan

Filed Feb. 9, 1971, Ser. No. 113,834

Claims priority, application Japan, Feb. 27, 1970, 45/19975

Int. Cl. B26d *7/14, 5/20, 2/06*

U.S. Cl. 83—175 **2 Claims**



A cutter device of rolled copy paper without interrupting the feeding of the copy paper for electronic copying machine having two sets of feeding rolls. A controllable arcuate bypass passage of the copy paper is formed, and the copy paper is cut while holding the rotation of one set of the feeding rolls and allowing the shape of the copy paper in the arcuate bypass passage to change.

3,673,906

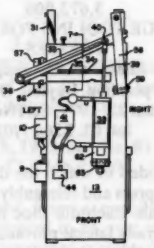
AUTOMATIC BORDER PANEL MEASURING AND CUTTING MACHINE

David R. Cash, Louisville, Ky., assignor to James Cash Machine Co., Louisville, Ky.

Filed Sept. 10, 1970, Ser. No. 71,086

Int. Cl. B26d *5/24, 5/00*

U.S. Cl. 83—208 **2 Claims**



An automatic border panel measuring and cutting machine wherein motorized pinch rollers feed a measured length of a mattress border panel and then stop while a pivotally mounted

knife swings from a ready position through a cutting zone, in which it cuts off that measured length, and then returns to its ready position to start the next feed and cut cycle. The knife, which is pivotally mounted at one end, has its opposite or free end not only connected to an air cylinder piston, which moves the knife back and forth for cutting and return purposes, but also engaged, during the cutting movement, by a yieldable guide means which directs the cutting edge of the knife into progressively tighter yieldable cutting (and knife-sharpening) engagement with a fixed cooperative cutting edge on the machine. The air cylinder is mounted for right and left and for front and rear pivotal movements to accommodate the corresponding movements of the blade.

3,673,907
ROTARY CUTTER

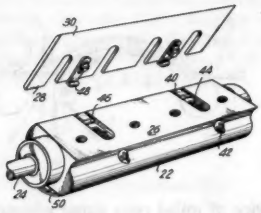
Takashi Watanabe, Nagoya, Japan, assignor to Kabushiki Kaisha Towa Denki, Nagoya-shi, Aichi-ken, Japan

Division of Ser. No. 809,281, March 21, 1969. This application Jan. 13, 1971, Ser. No. 106,195

Claims priority, application Japan, April 5, 1968, 43/22042; April 5, 1968, 43/26699; April 5, 1968, 43/26698; July 30, 1968, 43/53369

Int. Cl. B26d *1/36*

U.S. Cl. 83—674 **6 Claims**



A rotary cutter wherein a blade is removable from the body of the cutter when an edge of the blade is to be sharpened. A positioning member is adjustably connected with the blade member, so that the relative positions of the blade and positioning members can be adjusted so as to situate the cutting edge of the blade at a proper location with respect to the positioning member. The cutter body has a locating part which locates the positioning member at a predetermined position on the cutter body, so that in this way when the parts are assembled with the positioning member situated at the predetermined location on the cutter body, the blade will automatically assume its proper cutting position at the cutter body.

3,673,908
QUICK-CHANGE TOOLING FOR FINEBLANKING PRESSES

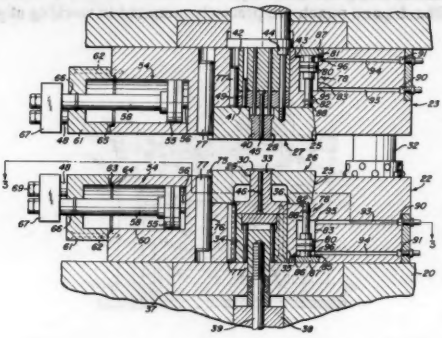
Roger K. Smith, Enon, Ohio, assignor to International Fineblanking Corporation, Dayton, Ohio

Filed Jan. 22, 1971, Ser. No. 108,759

Int. Cl. B26d *7/02*

U.S. Cl. 83—685 **15 Claims**

A die set is provided in which the die shoes remain essentially as part of the press and releasably retain interchangeable die members therein. Each die shoe includes locking means supported for generally lateral movement thereon and means for actuating the locking means between a locking position which positively retains a die member within a corresponding cavity in the die shoe and a retracted position which releases the die member for removal from the cavity. Each die shoe also includes ejecting means supported for generally axial movement thereon and means for actuating said ejecting means to eject the die member when the locking means is in its



retracted position. The die members are formed with recess means for receiving the locking means.

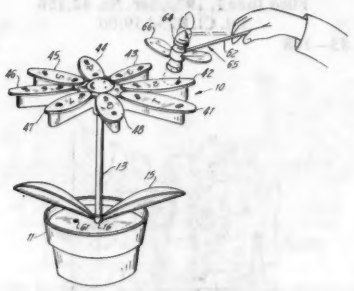
3,673,909
PERCUSSION MUSICAL INSTRUMENT

Melvin Birnkrant, Beacon, N.Y., assignor to Colorforms, Norwood, N.J.

Filed June 4, 1971, Ser. No. 149,903

Int. Cl. G10d *13/08*

U.S. Cl. 84—403 **9 Claims**



A percussion type musical instrument is formed as a representation of a flower having radiating petals. Each petal consists of an open bottom echo chamber and an elliptical tone bar secured to the top of the chamber by snap-type fastening means formed integrally with the chamber. The chambers are integrally formed with a hub section mounted to a downwardly extending stem-like post. Another hub section or cap is snap-connected to the first hub section and frictionally engages the upper end of the post to prevent rotation of the echo chambers about the post.

3,673,910
KEY BOLT

Frank C. Collister, 3641 North Dorko Drive, Port Clinton, Ohio

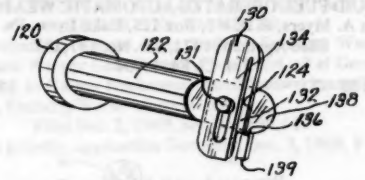
Continuation-in-part of Ser. No. 758,368, Sept. 9, 1968, Pat. No. 3,476,007. This application Oct. 30, 1969, Ser. No. 872,658

Int. Cl. F16b *21/00*

U.S. Cl. 85—3 R **3 Claims**

A key bolt including a shank having an open transversely disposed bolt slot at one end with an elongated planar key slidably disposed in the bolt slot. The key has end portions and spaced side walls forming a closed elongated key slot disposed

intermediate the ends of the key. A pin is transversely disposed in the bolt shank and passes through the bolt slot and through the key slot at substantially right angles thereto to slidably retain the key within the bolt slot. The key is slidable in the bolt slot to an unlocked position wherein the key extends directly outwardly of the shank and forms an extension thereof and is slidable to a locked position wherein the key is substantially perpendicular to the shank. In one form of the invention, at least a portion of one of the side walls of the key is severed or partially severed or slotted intermediate the ends thereof with one severed portion having its free end portion offset from and protruding out of the plane of the key to form a key lock abutting the bolt shank to retain the key in locked position. Such severed portion is yieldable to a position within the plane of the key to enable the key to be moved from locked position to unlocked position.

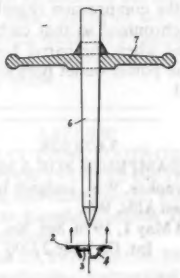


3,673,911

MOUNTING OF WHEELS ON SKI POLES

Rene Ramillon, 3, rue Emile Zola, Grenoble, France

Filed July 29, 1970, Ser. No. 59,309
Claims priority, application France, Aug. 1, 1969, 6926391
Int. Cl. F16b *21/00, 37/02*
U.S. Cl. 85—36 **3 Claims**



A Shakeproof washer formed in a stop ring, by pressing or punching, from a single metal stop ring so as to provide two concentric series of lugs, the lugs of one series being shorter than those of the other series and directed according to the generatrices of a cone less sharp than the cone of the longer lugs, said lugs extending radially inwards so as to engage the pole surface along two concentric but axially spaced circles for constantly retaining the wheel of the pole in an optimum position in which the bearing face of the washer engages the wheel perpendicularly to the pole axis.

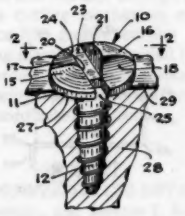
3,673,912

REMOVABLE TAMPERPROOF FASTENING MEANS

George E. Herr, 2711 West Brown Street, Milwaukee, Wis.

Filed Feb. 25, 1971, Ser. No. 118,888
Int. Cl. F16b *23/00*
U.S. Cl. 85—45 **8 Claims**

A head member is provided for a fastening means such as a screw, nut or bolt which can be turned in a direction to fasten the fastening means yet can be turned in a loosening direction only by a specially adapted tool. The head member has a transverse slot with two oppositely disposed shoulders which permit the turning of the head in a fastening direction. Two upwardly extending curved portions are provided which cause a slipping of a screwdriver when it is attempted to remove the fastening means. Removal is afforded by a notch extending into the head at the end of the slot which permits engagement by a projection on a specially adapted removing means.

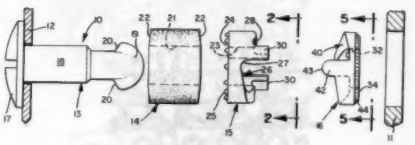


3,673,913

PANEL FASTENER WITH EXPANDABLE SLEEVE

John K. Barry, Springfield, Pa., assignor to Southco, Inc., Lester, Pa.

Filed Sept. 4, 1970, Ser. No. 69,745
Int. Cl. F16b *13/06*
U.S. Cl. 85—70 **1 Claim**



A second cam member has an axial clearance hole for receiving a T-shaped projection on 1 free end of a stud carrying a resilient sleeve radially expandable when axially compressed by axial displacement of a first cam member on the stud resulting from relative rotation between the cam members. The second cam member is also provided with notch means in its outer surface connected to the clearance hole by an internal helical ramp that operatively engages the projection upon rotation of the stud relative to the second cam member. Such relative rotation initially axially displaces both cam members and axially compresses the sleeve which exerts an opposite axial force on the cam members. Final relative rotation placing the stud in a predetermined angular position relative to the second cam member seats the projection in the notch means and keys the second cam member to the stud for rotation therewith. The residual axial force exerted by the sleeve maintains the projection seated in the notch means and develops a frictional force between the sleeve and first cam member that serves to prevent rotation therebetween.

3,673,914

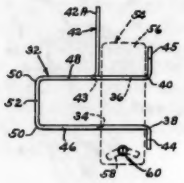
DRAFT KEY RETAINER LOCK FOR RAILWAY CARS

Robert W. Randolph, and Roy R. Dare, both of St. Charles, Mo., assignors to ACF Industries, Incorporated, New York, N.Y.

Filed Oct. 19, 1970, Ser. No. 81,861
Int. Cl. F16b *21/10*
U.S. Cl. 85—5 N **1 Claim**

A retainer lock formed from a metallic one piece flat rectangular blank and adapted to fit over the end of a draft key of a railway car. The one piece rectangular blank is folded into a yoke-like member and has two punched aligned openings, one opening being circular and the other being elongate with an elongate tab formed from the elongate opening and adapted to be folded downwardly over an elongate head

of a retainer pin in the aligned openings. A vertically extending projection adjacent each opening faces an adjacent center sill and the elongate tab forming the upper elongate opening



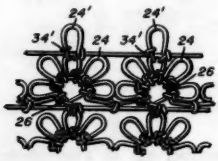
which extends into the upper adjacent vertically extending projection thereby to permit a tab of sufficient length to cover a substantial portion of the width of the elongate head of the retainer pin.

3,673,915

LOOP FABRIC STRUCTURE

Rosario Forlano Morcaldi D', 18 Haynes Street, East Boston, Mass.

Division of Ser. No. 765,886, Oct. 8, 1968, Pat. No. 3,548,706.
This application Oct. 20, 1970, Ser. No. 82,334
Int. Cl. D04g *1/00*; D04b *21/10*
U.S. Cl. 87—12 **1 Claim**



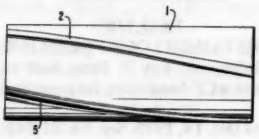
Needlework involving a loop fabric structure formed by a single thread or strand manipulated in a manner to define loops each of which is knotted to prevent unraveling thereby enabling the material to be cut at any desired point and employed for various purposes.

3,673,916

RIFLED LAUNCHING TUBE

Helge Wittholz, Oyle, Germany, assignor to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Filed April 24, 1969, Ser. No. 828,062
Claims priority, application Germany, April 24, 1968, P 17 03 248.3
Int. Cl. F41f *3/04*
U.S. Cl. 89—1.816 **10 Claims**



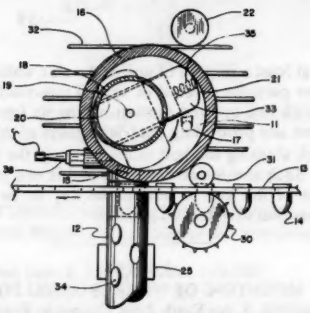
A launching tube for rockets and other projectiles, preferably with a hinged tail unit, including means for imparting a rotational motion to the rocket or projectile as it travels through the tube, which means for imparting rotation are provided in the form of helical grooves adapted to receive mating projections provided on the exterior surface of the rocket or projectile, and further including additional, substantially longitudinally-extending corrugations for imparting rigidity to the launching tube, thus facilitating the construction of the tube from relatively light-weight materials and in the form of relatively thin-walled tubes formed by drawing or extrusion processes. The present invention further contemplates a novel method for producing the rifled launching tube disclosed herein.

3,673,917

LIQUID FUEL OPERATED AUTOMATIC WEAPONS

Herman A. Myers, R.D. #1, Box 125, Lake Lynn, Pa.

Filed April 26, 1971, Ser. No. 137,287
Int. Cl. F41f *1/04*
U.S. Cl. 89—7 **10 Claims**



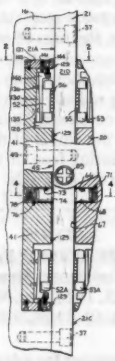
The automatic weapon has a compression chamber with a power outlet port aligned with a reciprocating barrel and an intake port aligned with a carburetor. A belt carrying a plurality of projectiles is fed between the reciprocating barrel and the power outlet port. A shaft driven rotor and vane are offset positioned within the compression chamber. The barrel, belt and rotor are synchronized so that carbureted fuel is compressed and ignited when the barrel has forced the belt to sealably engage the power outlet port with a projectile positioned in the barrel.

3,673,918

VIBRATION DAMPENER FOR A MACHINE TOOL

Frank Zankl, Milwaukee, Wis., assignor to Kearney & Trecker Corporation, West Allis, Wis.

Filed May 1, 1970, Ser. No. 33,698
Int. Cl. F16c *21/00*
U.S. Cl. 90—11 R **7 Claims**



This invention comprises means for adding adjustable dampening to a slidable machine tool member, such as a spindle head, that is secured to a supporting frame member by means

of anti-friction bearings. The dampening means are particularly adapted to selectively and adjustably compensate for vibration due to the anti-friction support means in such a manner as to increase both the quality and depth of a particular metal cutting operation by overcoming the tendency to vibration.

3,673,919

APPARATUS FOR HELICALLY MACHINING A BLANK OF VARYING DIAMETER

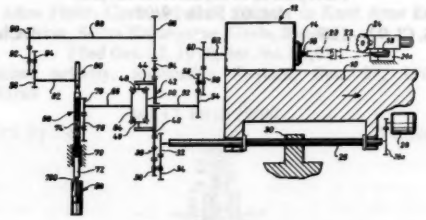
Hans Neuhauser; Helmut Benz, both of Enzberg, Wurttemberg, and Werner Gukelberger, Prum/Eifel, all of Germany, assignors to Gustav Neuhauser Praezisionswerkzeug-Fabrik o.h.G., Enzberg/Wurttemberg, Germany

Filed Dec. 2, 1969, Ser. No. 886,609

Claims priority, application Germany, Dec. 3, 1968, P 18 12 288.8

Int. Cl. B23c *3/32*

U.S. Cl. 90—11.62 **9 Claims**



A conical blank is rotated and simultaneously advanced so that a milling cutter cuts a helical groove into the same. In order to obtain a constant helix angle and a constant peripheral speed of the successively cut blank portions of different diameter, the rotary speed of the blank is cyclically varied by a control device including a cam and a cam follower influencing a differential transmission which connects drive means with the rotary blank.

3,673,920

APPARATUS FOR CUTTING SLOTS OR GROOVES IN PUNCH SUPPORT PLATES OR THE LIKE

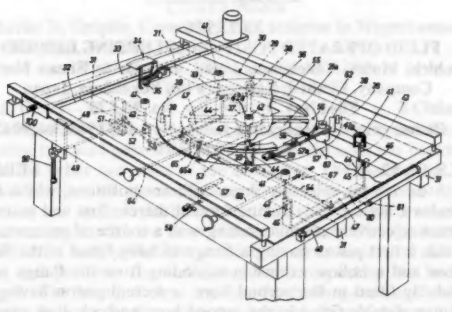
Werner Wahlen, Bern, and Hans Blumer, Zurich, both of Switzerland, assignors to Kapafar Business Trust Reg., Vaduz, Liechtenstein, Switzerland

Filed June 29, 1970, Ser. No. 50,801

Claims priority, application Switzerland, July 28, 1969, 11485/69; March 13, 1970, 3781/70

Int. Cl. B23c *3/28*

U.S. Cl. 90—58 B **5 Claims**



An apparatus for milling or cutting grooves in punch support plates, comprising a table-like lower or base portion at which there is mounted for rotation about a substantially vertical axis a rotary plate member constructed to support and fixedly retain a punch support plate. This rotary plate member can be locked or arrested in at least two rotational positions which are offset from one another through an angle of about 90°. Furthermore, a cutting mechanism equipped with an elevationally displaceable groove cutting tool is arranged above the rotary plate member and guided to be freely movable in one of two coordinate directions disposed at right angles to one another and being displaceable and capable of being arrested in the other coordinate directions.

3,673,921

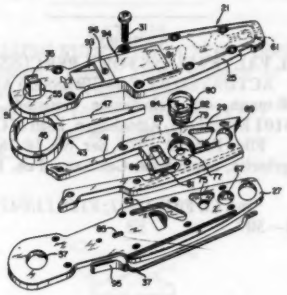
PRESSURIZED FLUID DEVICE

Russell A. Fritts, Phoenix, and Jerome I. Rebold, Timonium, both of Md., assignors to The Black and Decker Manufacturing Company, Towson, Md.

Filed June 8, 1970, Ser. No. 44,068

Int. Cl. F01c *9/00*; F01l *25/06, 21/02*

U.S. Cl. 91—299 **2 Claims**



A portable pneumatic tool including an elongated housing having a rotatable output member supported thereon and adapted to have a wrench socket attached thereto. Lever means within the housing is interconnected with the output member through one-way clutch means and is oscillated by compressed air whereby to impart unidirectional rotation to the output member. In addition, the tool may be used as a hand-type wrench in which case the elongated housing operates as a handle and the one-way clutch means causes the output member to turn conjointly with the housing in one direction only.

3,673,922

FASTENER DRIVING TOOL

Richard H. Doyle, Mount Prospect, Ill., assignor to Fastener Corporation, Franklin Park, Ill.

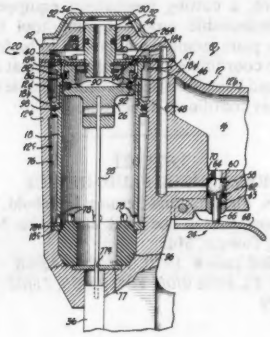
Filed Dec. 19, 1966, Ser. No. 602,728

Int. Cl. F15b *11/08*

U.S. Cl. 91—422 **15 Claims**

A pneumatic piston-driver blade return system for a pneumatic fastener driving tool includes an air return space continuously communicating with the lower end of a cylinder immediately adjacent a bumper. When a top valve for the cylinder is opened, compressed air drives the piston downwardly against the bumper, and a part of this air is passed through the piston into the air return space by means of an O-ring valved passage through the piston. When the cylinder top valve is closed and the top of the cylinder is vented to the atmosphere, the air in the return space enters the cylinder and acts on the lower surface of the piston to return the piston-

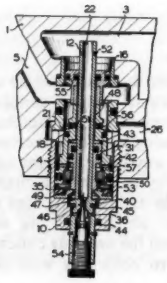
driver blade to a normal position in which it is held by frictional engagement of another piston O-ring with the cylinder wall. Air below the piston leaks out to the atmosphere through a driver blade clearance at the lower end of the cylinder.



3,673,923
CONTROL VALVE MEANS FOR A PERCUSSION DEVICE ACTUATED BY COMPRESSED AIR

Dieter Volkmann, 49, Leinstrasse, Neustadt, and Wilfried Lange, 3101 Brockhold, Altenhagen, both of Germany

Filed Feb. 12, 1970, Ser. No. 10,760
Claims priority, application Germany, Feb. 15, 1969, P 19 07 788.4
Int. Cl. F01l *25/02*; F15b *13/042*
U.S. Cl. 91—309 **2 Claims**



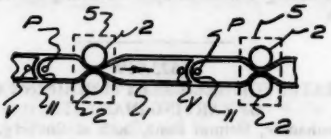
In a control valve assembly for a pneumatically operated percussion device, a control valve piston is slidably mounted on a hollow release valve stem and encloses an auxiliary valve member to provide for automatic sequential operation. The admission of compressed air to the hollow release valve stem is blocked by a valve ring mounted on said valve stem, and the stem is provided with means for adjusting the rate of sequencing of the control valve piston and the auxiliary valve member.

3,673,924
FLUID MOTORS

Zdzislaw Zakrzewski, 450 Vera Avenue, Redwood City, Calif.

Filed Oct. 5, 1970, Ser. No. 77,817
Int. Cl. F15b *11/08*; F01b *19/04*
U.S. Cl. 91—462 **6 Claims**

A resilient expansible chamber device having constricting rollers mounted around a resilient tube member. The controlled application of fluid pressure to the chamber and the simultaneous venting of fluid pressure from the chamber, on

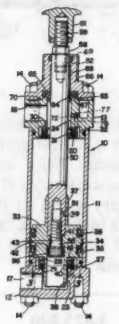


opposite sides of the constricting rollers, causes the constricting rollers to move relative to the expansible chamber.

3,673,925
FLUID MOTOR

Robert H. Davies, Aurora, Ohio, assignor to Parker-Hannifin Corporation, Cleveland, Ohio

Filed Jan. 6, 1969, Ser. No. 789,304
Int. Cl. F01b *29/00*
U.S. Cl. 92—128 **2 Claims**



A cylinder type fluid motor in which the piston and piston rod are each symmetrical whereby either end of the rod may be attached to either side of the piston and to the external working member. The rod is of uniform diameter throughout with only internal threads for attachment by means of high strength bolts or studs to the piston and working member whereby the rod may be of low cost material and yet provide high strength.

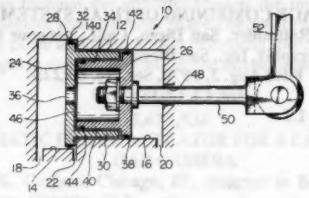
3,673,926
FLUID OPERATED POSITION SELECTING DEVICE

Yohichi Mohri, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Kanagawa-ku, Yokohama, Japan

Filed Nov. 3, 1970, Ser. No. 86,573
Claims priority, application Japan, Nov. 12, 1969, 44/90671
Int. Cl. F07b *7/20*
U.S. Cl. 92—51 **1 Claim**

A device for selecting three different positions, which includes a hollow body having formed therein first and second bores selectively communicating with a source of pressurized fluid, a first piston having a flange slidably fitted in the first bore and a hollow extension extending from the flange and slidably fitted in the second bore, a second piston having a flange slidably fitted in the second bore and a hollow extension extending from the flange of the second piston and slidably fitted in the inner peripheral wall of the extension of

the first piston, and a piston rod rigidly connected to the flange of the second piston. The positions of the second piston

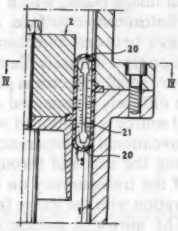


is shifted by selectively drawing a pressurized fluid into the first and/or second bores.

3,673,927
SEAL

Nils Allan Fluhr, Gavle, Sweden, assignor to Knut Arne Erik Rehnstrom, Sodra Fiskargatan, Gavle, Sweden

Filed Oct. 22, 1970, Ser. No. 83,084
Claims priority, application Sweden, Oct. 27, 1969, 14641/69
Int. Cl. F01b *19/00*
U.S. Cl. 92—98 **7 Claims**



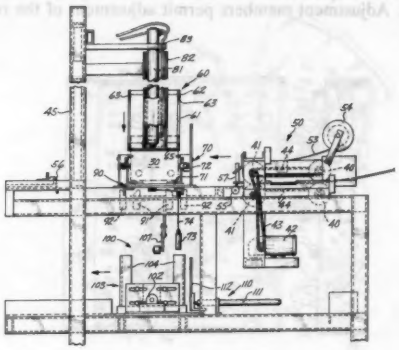
This disclosure relates to a seal between two relatively movable parts being spaced by at least one space with a feature of the seal being the provision between the parts of a casing or cover shutting off the space and attach to not only the one part but also to the other part. In the preferred usage of the seal, the casing or cover is disposed between a piston and a cylinder and has an annular form.

3,673,928
MACHINE FOR FORMING AND SEALING BLISS STYLE CONTAINERS

Charles D. Striplin, Concord, Calif., assignor to Weyerhaeuser Company, Tacoma, Wash.

Filed Aug. 27, 1969, Ser. No. 853,249
Int. Cl. B31b *1/46, 1/64, 17/02*
U.S. Cl. 93—36.3 **2 Claims**

A machine for forming and gluing a three-part container having two wall panels and a body panel forming the bottom and the other two walls of the container. The body panel is sealed to the wall panels by flanges which are attached to the bottom and walls of the body panel, and which bend over and are contiguous with the faces of the wall panels. The apparatus carries the body panel into position between a mandrel and a die, and positions the wall panels with respect to the body panel. The mandrel then carries the body panel and wall panels through the die cavity to blend the flanges toward the wall panel, and into a compression section. The compression unit has two active positions: the first holds the bent flanges at an included angle of less than 45° and the second compresses the flanges against the wall panels to bond the flanges to the

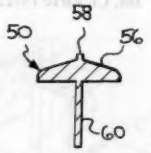


wall panels. When the compression unit retracts, the container is removed from the machine.

3,673,929
CREASING RULES FOR CUTTING DIES

Philip G. Saunders, Toledo, Ohio, assignor to Container Graphics Corporation, Toledo, Ohio

Filed Sept. 16, 1970, Ser. No. 72,577
Int. Cl. B31b *1/14*
U.S. Cl. 93—58.2 R **4 Claims**



A creasing rule for a rotary cutting die is provided. The creasing rule is used to produce an indented line in a corrugated board, along which line the corrugated board is to be folded subsequently, when formed into a final product, such as a container. The cutting die comprises a curved die plate fastened on a rotatable cylinder with the creasing rule mounted in the die plate. The new creasing rule includes a base or flange which extends through the die plate to contact and be backed up by the cylinder, which then positions the creasing rule at a fixed distance from the surface of the cylinder, even with a variation in the thickness of the die plate. Further, the creasing rule is designed with a broad tapered web on each side of an indenting ridge which produces the indented line, so that the possibility of breaking of the liner of the corrugated board when the indentation is made is minimized.

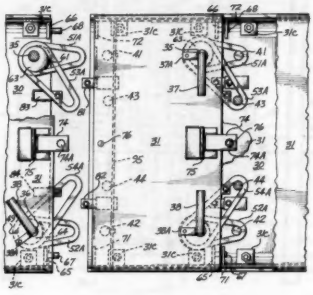
3,673,930
SCREED EXTENSION ASSEMBLY FOR ASPHALT PAVING MACHINES

Ralph D. Birtchet, Galvin, Wash., assignor to Schneider-Simpson, Inc., Tacoma, Wash.

Filed June 15, 1970, Ser. No. 46,309
Int. Cl. E01c *19/22*
U.S. Cl. 94—45 R **13 Claims**

Segmental extension units which interlock to provide selected extension of the screed of an asphalt paving machine are disclosed. Each extension unit has a forward end incor-

porating locking rings adapted to mate with studs in the trailing end of a preceding extension unit. The locking rings are disposed about cam surfaces so that upon rotation of locking handles two adjacent extension units will be rigidly interconnected. Adjustment members permit adjustment of the relative positions of adjacent lower surfaces of the extension members to accommodate wear of the assemblies and to permit the use of forward and trailing edges of the screed extensions as screed surfaces. Construction details of preferred embodiments are disclosed.

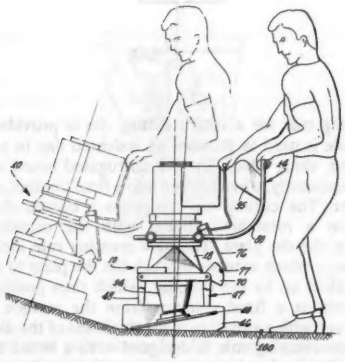


3,673,931

SELF-SUPPORTING COMPACTOR

Robert D. Dening, Los Angeles, and Leslie H. Garlinghouse, Pasadena, both of Calif., assignors to Garlinghouse Brothers Manufacturing Co., Los Angeles, Calif.

Filed Aug. 10, 1970, Ser. No. 62,261
Int. Cl. E01c *19/22*
U.S. Cl. 94—45 A **6 Claims**



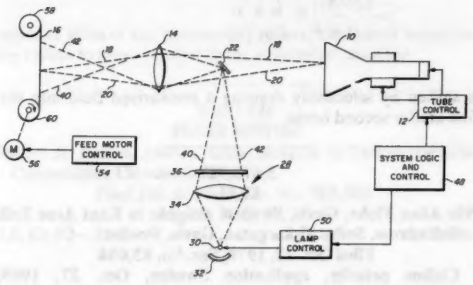
A self-supporting compactor consisting of frame, a motor on the frame, and a compactor plate at the lower end of the frame driven by the motor. The compactor plate has a central shaft tiltably mounted in a thrust head with respect to the motor drive shaft and freely rotatable so that as rotated there is one area on the edge of the compactor plate which shifts progressively around the circumference as the plate is driven with a wobble motion, thereby to provide a compacting force on a surface to be compacted. A pair of long parallel shoes on diametrically opposite sides of the frame are pivotally mounted on the frame and temporarily locked in nonpivoting position while the compactor is at rest and when the operation is being started. Once compacting commences, the shoes are released and automatically pivot from a supporting position, but return automatically and momentarily to supporting position during the compacting operation thereby to prevent the compactor from bouncing out of control.

3,673,932

IMAGE COMBINING OPTICAL SYSTEM

Edmund H. Rottmiller, San Diego, Calif., assignor to Stromberg Datagraphix, Inc., San Diego, Calif.

Filed Aug. 3, 1970, Ser. No. 60,225
Int. Cl. G03b *15/10*
U.S. Cl. 95—1.1 **8 Claims**



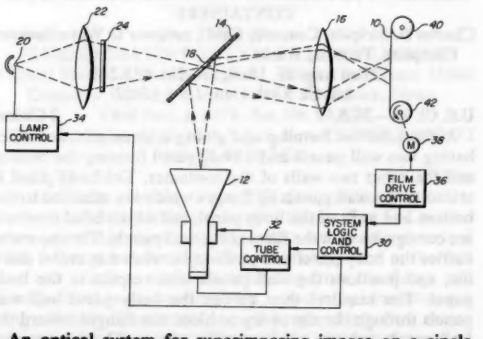
An optical system for combining two or more images from directionally and diffusely illuminated objects is disclosed. A non-directional, diffusely illuminated light-and-shadow object, such as a cathode ray tube face is positioned, approximately parallel, to an image plane, which typically may be a display screen or a photosensitive surface. A lens system is interposed along the axis between object and image plane to focus an image of the original diffusely illuminated object onto the image plane. A very small reflector is placed at an angle to the axis between the diffusely illuminated object and the lens system. A directional source is positioned so that the light projected through a conventional transparency is reflected from the small mirror along the axis and through the lens system forming an image of the transparency on the image plane in superimposed registration with the image from the diffusely illuminated object. The mirror is sufficiently small so as to block only a very small portion of the light from the diffusely illuminated object. If desired, a plurality of small reflectors may be used with a plurality of directional sources.

3,673,933

OPTICAL SYSTEM FOR SUPERIMPOSING IMAGES

Omer F. Hamann, La Jolla, Calif., assignor to Stromberg Datagraphix, Inc., San Diego, Calif.

Filed Aug. 3, 1970, Ser. No. 60,322
Int. Cl. G03b *15/10*
U.S. Cl. 95—1.1 **8 Claims**



An optical system for superimposing images on a single image plane from both directional and non-directional sources

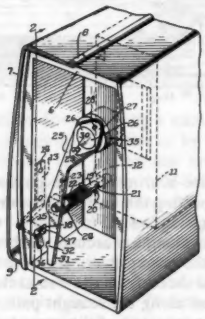
is disclosed. An apertured mirror is placed at an angle to a source of a diffused light image, to reflect light therefrom toward an image plane, such as a display screen or photosensitive sheet. A second, directional image is projected by an optical system through the aperture toward the image plane. A single objective lens assembly placed between the mirror and the image plane acts on light rays from both sources producing both images in superimposition in the image plane.

3,673,934

AUTOMATIC FILTER ACTUATOR FOR A CARTRIDGE LOAD CAMERA

Richard K. Carlson, Chicago, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed Sept. 2, 1969, Ser. No. 854,485
Int. Cl. G03b *17/12*
U.S. Cl. 95—11 **4 Claims**



This disclosure describes an automatic filter actuator for use in a cartridge load camera. A rod, having mounted thereon a torsion-compression spring and a lever arm, is aligned with a code notch in the cartridge. A filter is mounted on one end of the lever arm and the other end of the lever arm selectively impinges on a flat spring attached to the camera housing. When the film compartment door of the camera is closed and notch is present, the flat spring does not contact the lever arm and the filter remains in front of the camera lens. When the cartridge has no notch, the rod and lever arm are axially moved to a point where the lever arm impinges on the flat spring and, hence, the filter is moved from in front of the lens when the film compartment door is closed.

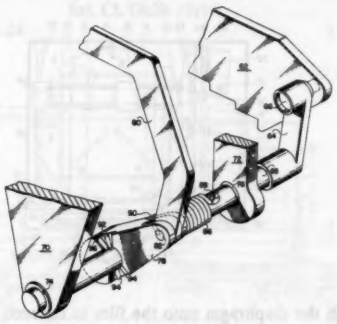
3,673,935

DRIVE SYSTEM FOR A REFLEX MEMBER

Edward H. Coughlan, Canton, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Nov. 2, 1970, Ser. No. 86,250
Int. Cl. G03b *19/02, 19/12*
U.S. Cl. 95—11 R **12 Claims**

A lost-motion connection between a drive member and a reflecting member mounted in a camera of the single-lens reflex type. The reflecting member is mounted for movement between first and second positions and the lost-motion connection therebetween includes a crank mounted on the drive member for limited rotation relative thereto and a spring having one end connected to the crank and its other end connected to the drive member. Should there be any interference with the reflecting member as it is being driven to the second position, the lost-motion connection allows the energy of the drive to be stored by the spring rather than being utilized in an attempt to drive the reflecting member thereby preventing an overload on the camera's motor and/or battery. Upon removal



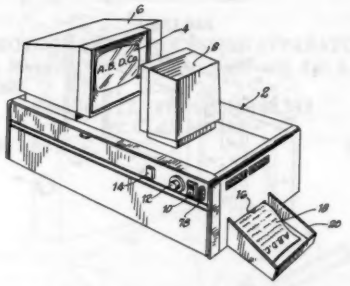
of the interference, the energy stored in the spring is utilized to drive the reflecting member toward the second position.

3,673,936

IMAGE COPYING APPARATUS

J. James Stone, Jr., 4058 Michelline Lane, Northbrook, Ill.; Thomas J. Madden, Jr., 428 Lilac Lane, Elk Grove Village, Ill.; Glendon T. Gerlach, 211 Maple Court, Lake Forest, Ill., and Robert I. Keur, 7138 Lill St., Niles, Ill.

Filed April 27, 1970, Ser. No. 32,305
Int. Cl. G03b *29/00*
U.S. Cl. 95—12 **6 Claims**



Apparatus for producing on paper a copy of images projected onto a viewing surface such as a cathode ray tube comprises elements for focusing the image onto the surface of electrostatic copying paper to expose the paper and means to then subsequently develop the exposed image. The apparatus is arranged so that the copy can be made while the surface on which the image is projected is available to be viewed by an observer. The disclosure includes means permitting the remote control of the apparatus as well as means whereby copies of images appearing on more than one viewing surface may be made.

3,673,937

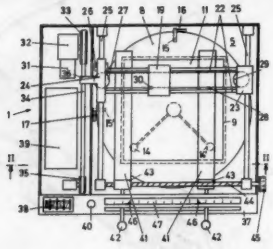
LINING DEVICE

Peter Ernst Mader, Lindenmoostrasse 13, Zurich, Switzerland

Filed May 19, 1970, Ser. No. 38,658
Claims priority, application Switzerland, May 30, 1969, 8275/69
Int. Cl. G03b *29/00*
U.S. Cl. 95—12 **8 Claims**

A lining device comprising guide means and drive means which control the movement of a projection device in two

coordinate directions over a photographic film. The projection device comprises a light source, an adjustable apertured diaphragm, and a lens which serves to direct light passing



through the diaphragm onto the film in reduced size so that when the projection device is moved, a line is exposed on the film.

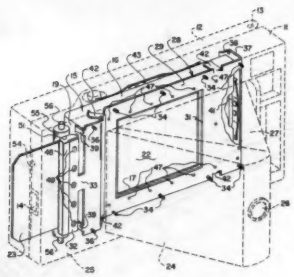
3,673,938

MULTIPLE FUNCTION FRAME MEMBER FOR CAMERAS

Chester W. Michatek, Rochester, and Donald M. Harvey, Webster, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed April 2, 1971, Ser. No. 130,753
Int. Cl. G03b *17/50*
U.S. Cl. 95—13 **7 Claims**

A self-processing camera adapted to be loaded with a film pack is provided with a novel internal metal frame member



that serves a number of functions including, increasing the structural rigidity of the camera housing, accurately establishing the operative location of the film pack within the camera housing, providing for convenient light-tight attachment of the camera bellows to the camera housing, and resiliently supporting a film processing pressure member to provide uniform pressure at the nip defined between that member and a roller or the like carried by the movable cover door of the camera housing.

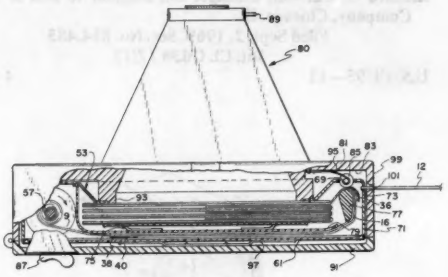
3,673,939

PHOTOGRAPHIC APPARATUS

Donald M. Harvey, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 2, 1970, Ser. No. 77,511
Int. Cl. G03b *17/52*
U.S. Cl. 95—13 **22 Claims**

An improved camera and cartridge for use with an assemblage of self-processing film units interconnected by an elongate, relatively flexible, unit-transporting web movable with the cartridge, each film unit including a pair of preregistered, superposed, relatively stiff, substantially flat sheets separably coupled to the web. The camera is provided with a chamber for receiving the cartridge, a spring-loaded member for applying pressure at a predetermined location in the cartridge, a mechanism for advancing the web inside the cartridge, and an exit opening at one end of the camera. The cartridge has a chamber for containing the assemblage, an exit slot at one end of the cartridge in alignment with the exit opening of the camera, through which the pairs of preregistered sheets of the film units are successively transportable along a substantially straight path as the web is moved within the cartridge in response to operation of the web advancing mechanism of the



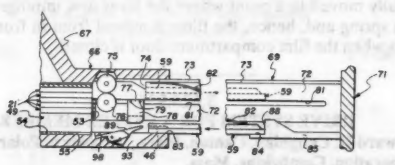
camera, a pressure-bearing and web-guiding member near the exit slot for supporting the web and film units against pressure applied by the spring-loaded member of the camera and for guiding the web along an arcuate path divergent from the straight path of the preregistered sheets to effect separation of the preregistered sheets from the web as the sheets are successively transported along the straight path, and a web take-up device at the opposite end of the cartridge which is rotatable by the web advancing mechanism of the camera for receiving and storing the web and processing waste material from the pressure-bearing and web-guiding member after the pairs of preregistered sheets have been separated from the web.

3,673,940

PRINT STRIPPING MECHANISM

Donald M. Harvey, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed July 2, 1971, Ser. No. 159,323
Int. Cl. G03b *17/52*
U.S. Cl. 95—13 **5 Claims**

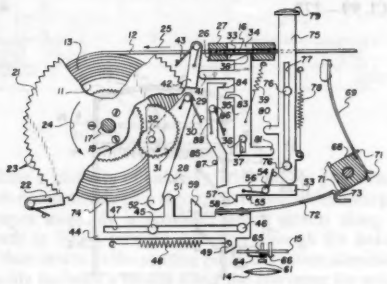


A processing camera and print stripping mechanism for use with self-processing film units. The film units include an image-recording element separably coupled to a generally rigid carrier or frame. Grooves in the frame guide movement of camera stripper fingers between the image-recording element and the frame to separate the element from the frame as the film unit is moved endwise in the camera. The stripper fingers are pivotally mounted in the camera and include frame engaging surfaces or cams for producing relative lifting movement of the fingers to enhance their stripping action.

3,673,941
CAMERA COCKING MECHANISM

Francis A. Williams, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 17, 1970, Ser. No. 99,184
Int. Cl. G03b *1/04, 17/42*
U.S. Cl. 95—31 AC 8 Claims

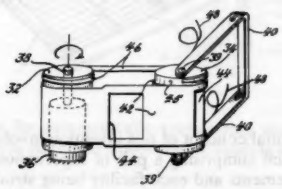


A camera mechanism for preparing a camera to effect an exposure, such as by cocking a shutter or by indexing a multilamp flash unit socket. The mechanism employs a single-lobed and spiral-shaped cam or gear in a linkage that translates motion from a drive member, associated with film movement, to the shutter or socket. Substantially one complete revolution of the gear performs its intended functions, and then the gear automatically is disengaged from the drive member to permit further rotation of the member without further influence on such functions. The mechanism is particularly adapted for translating rotational motion, such as from a film-winding drive, either to linear motion or to complex motion including a substantial linear component, for cocking the shutter and indexing the socket. The mechanism is also adapted for metering advancement of film in the camera and for preventing double exposures.

3,673,942
CAMERA SHUTTER

Frederick M. Tingley, Lincoln, Mass., assignor to The United States of America as represented by the Secretary of the Air Force

Filed Oct. 20, 1969, Ser. No. 867,620
Int. Cl. G03b *9/28*
U.S. Cl. 95—57 3 Claims

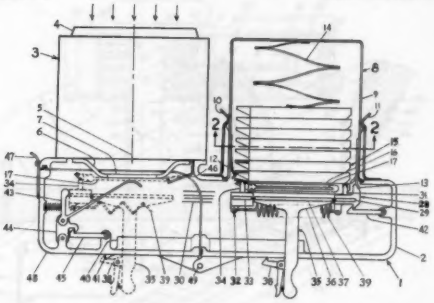


A shutter for use with a conventional camera utilizing a rotary stepper servo motor as a drive means. The motor drives a first drum which in turn drives a second drum in order to advance a curtain attached thereto. This curtain has a plurality of slits therein which act as the shutter of the camera as they pass before the optical cone of the camera.

3,673,943
CAMERAS

Harry G. Corrigan, 258 Amalfi Drive, Los Angeles, Calif.

Filed May 13, 1970, Ser. No. 36,857
Int. Cl. G03b *19/10*
U.S. Cl. 95—24 1 Claim

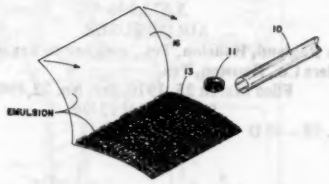


A camera in which the photographic emulsion for each single exposure is on a rigid plate in a light-proof but openable container. A removable magazine on the camera stores several of the emulsion containers. The camera contains mechanism for opening the container to permit exposure, reclosing and locking the container, and ejecting the locked container or transferring it to a storage magazine. Plates carrying the emulsion can be keyed for individual identification. When opened, the emulsion is held at the precise focal plane of the camera optical system.

3,673,944
PHOTOGRAPHIC PROCESSING APPARATUS

Hugh W. Maxwell, 999 East Valley Boulevard, Apt. 6, Alhambra, Calif.

Filed June 22, 1970, Ser. No. 48,392
Int. Cl. G03d *3/00*
U.S. Cl. 95—89 R 3 Claims

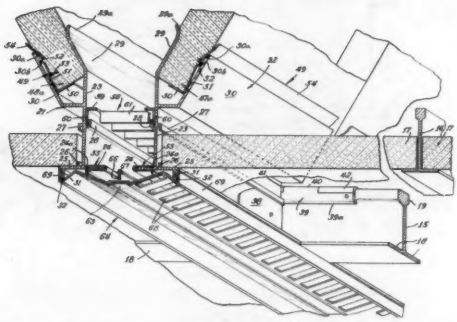


This disclosure involves a photographic processing tank designed to develop large size photographs in a compact device employing a minimum volume of standard photographic reagents. The disclosure involves a tubular tank with removable end cap or caps and a porous inner liner which is unaffected by reagents and exhibits non-capillarity and non-wetting characteristics. The liner is flexible so that it may be rolled up against the light sensitive emulsion side of printing paper without damage thereto.

The tank holds the reagents and the porous liner spaces the paper while allowing the rapid flow and circulation of reagents through the entire contents of the tube and in intimate contact with all areas of the emulsion.

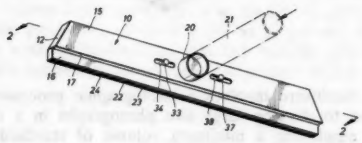
Any and all standard photographic chemicals may be used with this invention.

3,673,945
VENTILATING AIR DISTRIBUTING CHANNEL
Joel R. Rachlin, 1785 Wedgewood West, Elm Grove, Wis., and Rudolph Otto Neudek, W271N1275 Meadowbrook Road, Waukesha,, Wis.
Filed Feb. 11, 1970, Ser. No. 10,508
Int. Cl. F24f *13/06*
U.S. Cl. 98—40 D 21 Claims



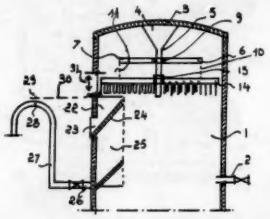
The supporting grid (e.g., main and cross inverted tees) of a suspended ceiling also completely supports ventilation air-distributing apparatus which may include the air supply duct. This apparatus, which is completely assembled before mounting in the grid, comprises a lower air flow channel section formed of two extruded metal bars having vertical webs with hooks on the outside of the web defining ways into which the wings of a bracket project to hold the spaced bars in a channel assembly. A clip integral with the bracket hooks over the top of a grid tee and has gripper conformations to mate with a clip on the opposite side of the tee to align channels. Along the top of the web of each bar are two outwardly extending spaced arms which are used to hold the sides of a fiberglass air duct. Between the webs and below the air duct is an optional air extractor. The air from the duct discharges out through the opening between the webs. At the bottom of the webs are flanges forming supports for ceiling panels and air flow control dampers.

3,673,946
AIR DIFFUSER
Douglas Ragland, Houston, Tex., assignor to Texas Investment Builders Co., Houston, Tex.
Filed March 25, 1970, Ser. No. 22,490
Int. Cl. F24f *13/06*
U.S. Cl. 98—40 D 8 Claims



Wall means define a generally elongated, narrow air passage having an air discharge aperture extending substantially the full length of the elongated air passage and an air inlet located generally centrally of the elongated dimension of the air passage. A baffle or air deflecting means, disposed within the air passage opposite the mouth of the air inlet, is shaped so as to direct air entering the air passage in both directions along the elongated dimension of the air passage. Preferably the diffuser is equipped with adjustable shutter means mounted within the air passage and engageable with the air inlet so as to control the volume of air moving into the air passage from the air supply.

3,673,947
VINIFICATOR
Eugene Scazzola, 1 Rue de l'Averse, 94 Creteil, France
Filed April 5, 1971, Ser. No. 130,996
Claims priority, application France, May 22, 1970, 7018647
Int. Cl. C12b *1/22*
U.S. Cl. 99—278 4 Claims



A vinificator has a vat, a plurality of radial driving arms rotatable about a vertical axis and disposed at the upper part of the vat, means for rotating the arms, a corresponding plurality of rakes disposed in the vat below the driving arms and carried by a bush rotatable about the same axis as the driving arms, said rakes being angularly pivotable with respect to the bush, a flexible connection between each driving arm and a corresponding rake, deflector means carried by at least one of said rakes for deflecting towards the wall of the vat the marc forming on top of the contents of the vat, and an evacuation funnel for marc disposed internally adjacent the wall of the vat.

3,673,948
MULTIPLE FACILITIES FOR ASSEMBLING COOKING AND DISPENSING FOOD-PRODUCTS
Charles Jere Albright, 313 W. North Ave., Chicago, Ill.
Filed Jan. 25, 1968, Ser. No. 700,608
Int. Cl. A47j *37/08*
U.S. Cl. 99—355 10 Claims

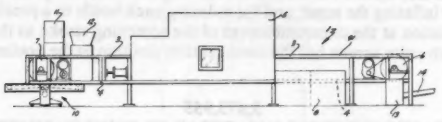
The essential concept of this invention involves one or two facilities each comprising a pair of superimposed, relatively-shiftable elements and each facility being structured to have positioned thereon an ordered arrangement of portioned food-products subject to their being transferred, in the same ordered arrangement, onto an under-positioned support as a result of the relative shifting of the respective pair of elements; the facilities being adapted for use individually or collectively to position an ordered-arrangement of food-serving components on the under-positioned support and subsequently having the same ordered-arrangement of portioned cooked food-products superimposed on the previously-arranged food-serving components on the under-positioned support.

3,673,949

CONTINUOUS PAN CONVEYOR BAKING APPARATUS

Ned H. Arganbright; Paul J. Koepnick; Carl T. Nelson, and Arthur E. O'Brien, all of Grand Rapids, Mich., assignors to Werner Lehara, Inc., Grand Rapids, Mich.

Filed Sept. 16, 1970, Ser. No. 72,733
Int. Cl. A21b 3/06
U.S. Cl. 99—443 24 Claims



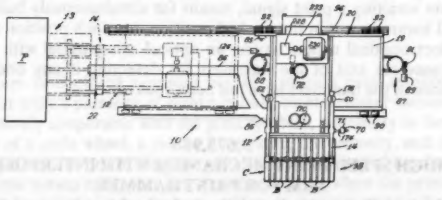
For baking a plurality of cakes or other edible products in pans which continuously pass through an oven, an endless pan and conveyor assembly is provided which travels along an endless path in first a forward direction through the baking oven and then return to the starting point in a return direction. The assembly includes a means along the conveyor for selectively removing the pans from the conveyor while moving in the return direction. Specifically, a plurality of brackets are provided on spaced conveyors. The brackets support the pans which span the distance between the spaced conveyors, the pans being removable by a camming mechanism associated with the conveying means. After the cakes are baked they are released from the pan by a conveying mechanism which holds the cakes while reversing their direction so that they are conveyed from the releasing mechanism in an upright position. Further operations on the cake include slicing the same by a novel slicing mechanism, topping one of the parts so sliced and then returning the parts to a station where they are placed together, such stations being spaced longitudinally along the conveyors by reason of a special type of conveyor mechanism.

3,673,950

AUTOMATIC COTTON BALE TRANSFER APPARATUS

Albert T. Koehler, Monticello; Paul J. Shideler, Logansport, both of Ind., and Linus E. Dohogne, Paragould, Ark., assignors to A. J. Gerrard & Company, Des Plaines, Ill.

Filed Dec. 24, 1969, Ser. No. 887,963
Int. Cl. B65b 13/20
U.S. Cl. 100—7 8 Claims



An apparatus for automatically transferring cotton bales from an unbanding station to a press and rebanding station.

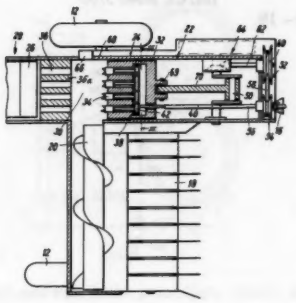
3,673,951

METHOD FOR COMPACTING FODDER OR THE LIKE

Gerhard Romer, Nillbergstr. 13, Einod/Saar, Germany

Filed Oct. 21, 1968, Ser. No. 769,143
Claims priority, application Germany, Oct. 20, 1967, P 16 27 903.1
Int. Cl. B30b 15/34; B41f 3/42
U.S. Cl. 100—38 7 Claims

Fodder is converted into shape-retaining blocks or cakes by an apparatus which collects fodder off the ground and subjects it to a preliminary compacting action, thereupon to a twisting action which results in the formation of ropes of convoluted material, and to a final compacting action resulting in conversion of ropes into blocks or cakes of firmly compacted material. The twisting and final compacting actions can be carried out sequentially or simultaneously.

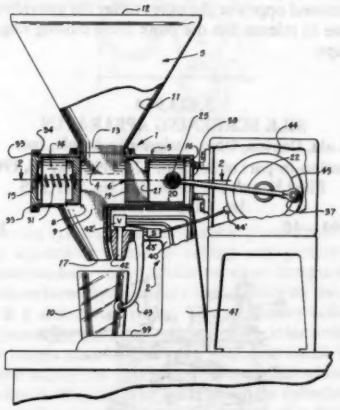


3,673,952

JUICE EXTRACTING DEVICE

George A. Durbin, III, 3rd & Fremont, Manhattan, Kans.

Filed Feb. 16, 1971, Ser. No. 115,323
Int. Cl. B30b 15/08
U.S. Cl. 100—98 10 Claims



A device for extracting juice from citrus fruit and for use with a beverage dispensing device including a housing having a fruit entrance to receive fruit from a hopper-shaped member and a piston reciprocable within the housing to effect cutting and squeezing of citrus fruit by moving citrus fruit into engagement with a fixed blade and a resiliently mounted abutment member which then moves cut and squeezed fruit through a fruit exit of the housing and into a beverage container adjacent the beverage dispensing device upon movement of the piston to a release position, all in response to activation of the beverage dispensing device.

3,673,953
APPARATUS FOR CUTTING INDICIA FROM TAPE

Bernard J. Massari, 725 Hart Drive, Somerville, N.J.

Continuation of Ser. No. 10,704, Jan. 26, 1970, abandoned, which is a division of Ser. No. 618,540, Feb. 24, 1967, Pat. No. 3,558,425. This application Sept. 18, 1970, Ser. No. 73,657

Int. Cl. B44b *5/00*

U.S. Cl. 101—19 **7 Claims**

Apparatus for cutting indicia from the second layer of a multi-layer tape including at least a first layer and said second layer, including a die plate having a raised cutting ridge formed thereon with the ridge being at least equal in height to the combined thicknesses of the first and second tape layers; a pair of spaced apart pressure rollers for receiving the tape therebetween, one of the rollers provided with a flat surface along a portion of its periphery, means for positioning the flat surface opposite the tape and upon the flat surface being so positioned, the rollers also are for receiving the die plate therebetween opposite the tape received between the rollers, means for rotating the rollers to cause the rollers to move the die plate ridge into cutting engagement with the tape and to advance the tape and the die plate between the rollers in cutting engagement to cause the cutting ridge to apply cutting force through the first layer, without cutting the first layer, and to the second layer to cut indicia from the second layer, the flat surface upon the flat surface being rotated and again being positioned opposite the other roller for providing a pressure release to release the die plate from cutting engagement with the tape.

3,673,954
SILK SCREENING APPARATUS

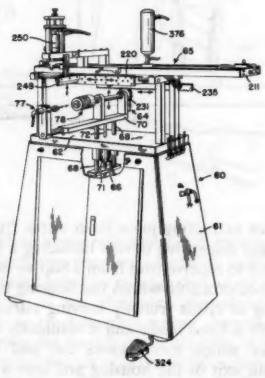
Louis A. Lala, Dayton, Ohio, assignor to Amole, Inc.

Continuation-in-part of Ser. No. 728,449, May 14, 1968

Filed March 14, 1969, Ser. No. 807,195

Int. Cl. B41f *17/22*

U.S. Cl. 101—40 **10 Claims**



Method and apparatus for silk screening a halftone color photograph onto a container having an arcuate outer surface. Precise index marks are provided on the color art work and are utilized through the preparation of the silk screens and the setup of the screening apparatus to provide precise alignment as required to silk screen properly the several different colors onto the bottle. The machine has improved adjustments which allow the screens to be easily and quickly precisely aligned during setup so that the color halftone can be printed without overlap of the dots except where desired. The apparatus also includes automatic means for loading the bottle in position, for inflating the same, and for indexing each bottle to a precise location at the commencement of the screening stroke so that each color screen has the same relative position to the bottles.

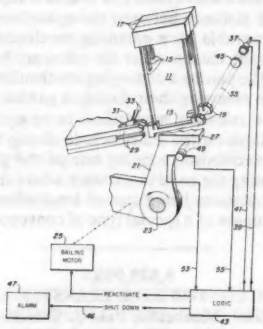
3,673,955
MEANS DETECTING NON-REBAILED PRINT HAMMERS TO RECYCLE THE BAILING MEANS

Robert H. Curtiss, Wayland; Richard Holzman, and Seldan A. Lazarow, both of Framingham, all of Mass., assignors to Nortec Computer Devices, Inc., Southboro, Mass.

Filed July 22, 1970, Ser. No. 57,103

Int. Cl. B41j *9/16*

U.S. Cl. 101—93 C **9 Claims**



A printer is disclosed having a number of hammers aligned along a transverse axis which hammers are in a cocked position awaiting a print signal, means for simultaneously bailing all hammers not in the cocked position into such position and electrooptical means having an optical axis parallel with the transverse axis of the hammers for detecting if any one or more of the hammers have not been cocked.

3,673,956
HIGH SPEED PRINT MECHANISM WITH INTERPOSER ARM FOR PRINT HAMMER

Manfred Huber; Norbert Klimek, both of London, and Kenneth Herbert William Dee, Enfield, all of England, assignors to English Numbering Machines Limited, Enfield, Middlesex, England

Filed Jan. 22, 1970, Ser. No. 4,951

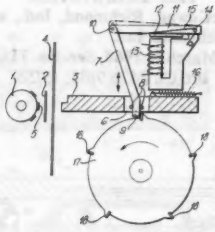
Claims priority, application Great Britain, Jan. 31, 1969, 5,307/69

Int. Cl. B41j *9/32*

U.S. Cl. 101—93C **3 Claims**

Printing mechanisms comprising print hammers driven by striker arms selectively struck by projections on a rotating striker drum so that characters on print wheels are selectively printed on a sheet interposed between the wheels and the hammers. The striker arms are normally resiliently retained out of the path of the drum projections and selective energization of electromagnets causes the striker arms to be displaced

into said path and thus impacted thereby causing a print to be made. Energization of the electromagnets may be controlled through a pulse counter which is fed in dependence on the rotation of the striker drum.

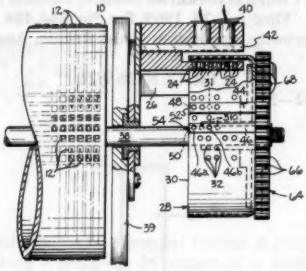


3,673,957

HIGH SPEED PRINTER INCLUDING CHANGEABLE CODE MEANS

John Guzak, Jr., Arlington Heights, Ill., assignor to SCM Corporation, New York, N.Y.

Filed Feb. 17, 1969, Ser. No. 799,815
Int. Cl. B41j 7/54; G08c 9/06
U.S. Cl. 101—93 C 2 Claims



There is disclosed a printer having a moving print symbol carrier with a plurality of print symbols, print hammer means selectively cooperable with the print symbols, a memory in the form of a code wheel, a reader for reading the memory, and a comparator for controlling initiation of operation of the print hammer means in response to a received signal when the print symbol carrier is in the proper position as determinted by the reader, the code wheel having one set of code elements corresponding to each print symbol, two sets of code elements being interchangeable.

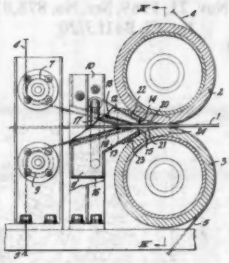
3,673,958

PROCESS AND MACHINE ACCORDING TO THIS PROCESS FOR PRINTING OR DYEING TEXTILES OR SHEET MATERIAL

Jan Maria G. R. Billiet, Beverlaai 55, Kortrijk, Belgium

Filed Sept. 19, 1969, Ser. No. 859,455
Int. Cl. B41l 13/08
U.S. Cl. 101—122 5 Claims

Apparatus for printing or dyeing textiles or sheet material, whereby sheet material is printed and dyed by locally applying an endless screen on at least one face of said material by means of a pressure roll, color being continuously fed between said screen and said roll, in the immediate vicinity of the pressure line.

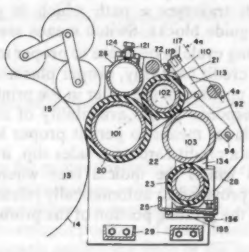


3,673,959

DAMPENING SYSTEM FOR LITHOGRAPHIC PRINTING PRESS

Leslie J. Jezuit, Lyons, and Harold R. Kollars, Elk Grove Village, both of Ill., assignors to North American Rockwell Corporation, Pittsburgh, Pa.

Filed April 22, 1970, Ser. No. 30,781
Int. Cl. B41l 25/00, 41/00; B41f 35/00
U.S. Cl. 101—148 6 Claims

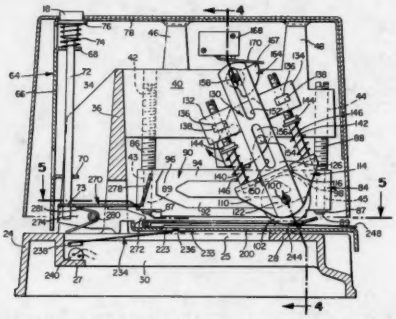


A dampening system for a lithographic press which includes a resilient applicator roller in rolling engagement with a resilient intermediate roller which receives dampening fluid from a hard-surfaced hydrophilic roller. Riding on the applicator roller is a distributor roller. The applicator roller is arranged adjacent an ink form roller and the intermediate and distributor rollers are mounted on a subframe which is rockable about the axis of the applicator roller so that when the applicator roller is tripped away from the plate cylinder the intermediate roller may be disengaged from the hydrophilic roller while the distributor roller is swung into engagement with the ink form roller. All rollers on the downstream side of the hydrophilic roller are thus coupled to the ink system for convenient and simultaneous wash-up. The intermediate roller has means arranged approximately at right angles for adjusting the pressure applied by it to the applicator roller and to the hydrophilic roller. The intermediate roller is gear driven from the plate cylinder and serves to drive the applicator roller at press surface speed by frictional contact when the applicator roller is tripped away from the plate cylinder, with a slip clutch being interposed in the gear train so that the speed of the applicator roller is controlled by, and corresponds to, the surface speed of the plate when the applicator roller is in its working position.

3,673,960
TRAVELING CYLINDER PRINTER WITH PLATEN ROLLER DRIVEN IN CLOSED PATH

Vero Ricci, 106 E. Stiles Ave., Collingswood, N.J., and Edward P. Colalillo, 23 Colwick Road, Cherry Hill, N.J.

Filed Nov. 21, 1969, Ser. No. 878,814
Int. Cl. B41f 3/20
U.S. Cl. 101—269 16 Claims



Credit card printing apparatus for printing information embossed in a credit card on a sales slip, comprising a floatingly mounted, resiliently biased roller platen, drive means to drive said platen through a closed travel path having a substantially planar printing section and a spaced section substantially parallel to the printing section. The roller drive includes a slide crank mechanism to impart the desired motion to the roller platen, which traverses a path which is preferably defined by suitable guide blocks. Switch means are provided to regulate the printing cycle in response to proper insertion of a credit card in the credit card tray, proper placement of the credit card tray, the position of the roller in the printing cycle, and optionally in response to the availability of credit. The credit card tray includes means to permit proper location of printed indicia from a credit card on a sales slip, irrespective of the direction in which the indicia face when inserted. Means may also be provided to automatically release the tray upon completion of the printing portion of the printing cycle.

3,673,961
XEROTHERMOGRAPHIC PROCESS

James G. Jarvis, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed April 27, 1960, Ser. No. 25,108
Int. Cl. B41m 5/18
U.S. Cl. 101—465 22 Claims

A reproduction method wherein a heat-sensitive layer, upon receiving a uniform electrostatic charge, is exposed to a thermal image of the document being copied, such exposure serving to selectively dissipate the uniform charge on the heat-sensitive layer to produce a latent electrostatic image thereon. The latent image is rendered visible by conventional xerographic development techniques.

3,673,962
LITHOGRAPHIC DUPLICATING METHOD AND LITHOPLATE MASTER THEREFORE

Burt K. Sagawa, Bloomington, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

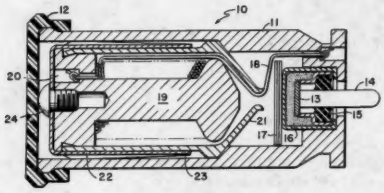
Filed Sept. 23, 1970, Ser. No. 74,889
Int. Cl. G03f 7/02
U.S. Cl. 101—467 20 Claims

A high quality long run lithographic printing plate is produced by applying an alpha-naphthol first reactant at image areas to a lithoplate master containing as co-reactants for the alpha-naphthol both ionic iodide compound and ionic chromium compound, and heating the plate.

3,673,963
TRIP-LINE SYSTEM

Kenneth J. J. McGowan, Richmond, Ind., assignor to Avco Corporation, Richmond, Ind.

Filed March 5, 1968, Ser. No. 711,165
Int. Cl. F42b 9/02, 13/56
U.S. Cl. 102—38 2 Claims

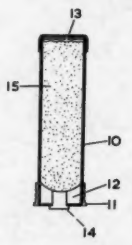


The invention is a method and an apparatus for laying trip lines for sensing disturbances which are used to detonate explosive devices such as land mines. A controlled charge is used to generate a force in excess of that required to throw the trip line a predetermined distance and a stainless steel wire capable of substantial elongation without rupture is simultaneously used to dissipate such excess force.

3,673,964
SHOTGUN POWDER PACKAGE

Charles Herbert Rigby, West Kilbride, Scotland, assignor to Imperial Chemical Industries Limited, London, England

Filed July 24, 1969, Ser. No. 844,484
Claims priority, application Great Britain, Aug. 28, 1968, 40,614/68
Int. Cl. F42b 9/26
U.S. Cl. 102—39 20 Claims



A shotgun powder package comprising a reusable shotgun cartridge containing a plurality of powder charges, the mouth of the case being closed with a removable end-cap secured without distortion of the mouth.

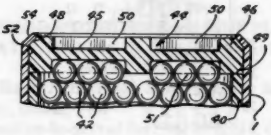
3,673,965
OVER-SHOT WAD FOR SHOTSHELLS

George L. Herter, Waseca, Minn., assignor to Herter's, Inc., Waseca, Minn.

Filed Sept. 8, 1969, Ser. No. 855,974
Int. Cl. F42b 7/08
U.S. Cl. 102—95 1 Claim

An improved end closure for the mouth of a shotshell having a case formed from relatively hard plastic comprising an over-shot wad of relatively soft, yieldable plastic formed in the shape of a disc and having a beveled or angled peripheral edge against which the mouth end of the shell case is bent or

crimped inwardly a very short distance in abutting and restraining engagement therewith. The disc-shaped closure wad includes an annular wall segment of extended length on



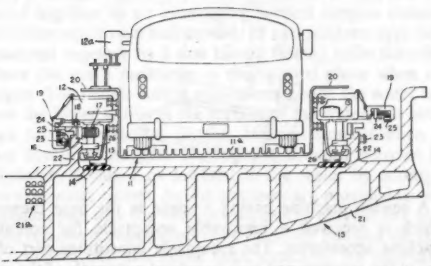
which said beveled surface is formed, said annular wall segment having a substantial thickness and being reinforced by a plurality of ribs extending radially of said closure wad.

3,673,966

ELECTRIC GUIDEWAY TRANSPORTATION SYSTEM

David G. Wilson, Cambridge, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Nov. 24, 1969, Ser. No. 879,318
Int. Cl. B60s *13/02*; B61b *13/02*; B61i *1/10*
U.S. Cl. 104—1 R **6 Claims**



A palletized automated transport vehicle is propelled and controlled along a guideway by means of a vertical rotary synchronous motor in combination with a vertical cog drive. The motor is fixed to the vehicle; the cog drive is supported by the guideway. The combination allows the vehicle to be driven at a constant or variable speed, and to be controlled with respect to headway or position, and therefore, with respect to other vehicles along the guideway.

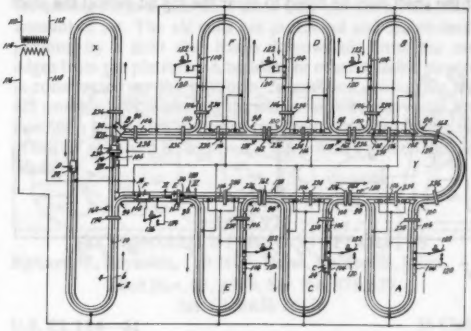
3,673,967

CONVEYOR SYSTEM FOR DRIVE-IN RESTAURANTS

Frederic F. Kropf, 2419 N. 72nd Place, Kansas City, Kans.

Filed Aug. 17, 1970, Ser. No. 64,378
Int. Cl. B61l *1/04*
U.S. Cl. 104—88 **3 Claims**

A conveyor system for drive-in restaurants consisting of a plurality of tray-supporting carriages which are electrically driven to move along a track system including rails from which they derive their power, said track system including a holding loop, a delivery loop branching from and returning to said holding loop, a series of station loops branching from and returning to said delivery loop, a switch operable to divert carriages from the holding loop to the delivery loop, said switch being operable to divert only a pre-selected carriage, a series of switches each operable to divert carriages from said delivery loop to one of said station loops, each of said latter switches being pre-set to divert only one of said carriages, and means operable to arrest the movement of each carriage in its



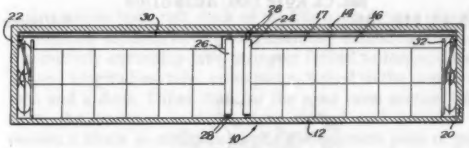
individual station loop and at other selected points of the track system.

3,673,968

PNEUMATIC SAFETY SYSTEM FOR VEHICLE LADING

Leroy W. Bertram, Wheaton, Ill., assignor to Unarco Industries, Inc.

Filed Dec. 30, 1969, Ser. No. 889,141
Int. Cl. B60p *7/14*; B61d *45/00*
U.S. Cl. 105—369 BA **10 Claims**



A system for protecting lading against endwise impacting in an ordinary side-loading vehicle body is achieved with movable panels positioned to engage the ends of the lading and with inflatable envelopes positioned to substantially simultaneously move the panels against the ends of the lading. The inflatable envelope means adjacent one end of the lading communicate with the envelope means adjacent the other end of the lading to provide that each envelope means serves as a pressure accumulator for the other envelope means when the lading tends to shift against the first envelope means. The panel is suspended from a fixed support by spaced elongated arms that provide for rocking and skewing of the panel at edge connections located at substantially mid-height of the panel. Bias means are provided which tend to deflate the envelopes and which are arranged to tend to exert oppositely-directed moments upon each panel about its mid-height pivot connections. One arrangement of inflatable envelopes operates to develop greater pressure against the portion of the lading below the mid-height pivot connections for the movable panel.

3,673,969

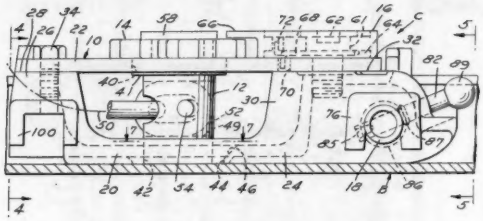
VEHICLE TIE-DOWN DEVICE

Israel E. Peisner, Huntington Woods; George H. Stol, Berkley, and Eugene D. Gotcher, Gibraltar, all of Mich., assignors to Whitehead & Kales Company, River Rouge, Mich.

Filed May 7, 1970, Ser. No. 35,498
Int. Cl. B60P *7/08*; B61d *45/00*
U.S. Cl. 105—369 A **14 Claims**

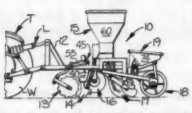
A vehicle tie-dow device comprising a carriage adapted to be locked in longitudinally adjusted position on a rail extend-

ing lengthwise of the deck of a transport, such as a rail car. The carriage has a rotatable shaft upon which is wound a chain adapted to engage ad hold a vehicle. The shaft has a lug normally preventing it from being withdraw from the carriage, but the shaft may be tilted to clear the lug ad permit the shaft



to be withdrawn or inserted. A ratchet gear ad pawl are provided for preventing shaft rotation in one direction. The pawl has a tab overlying the gear to prevent accidental withdrawal of the shaft when the gear is engaged by the pawl. A sprig pressed lock pin on the carriage secures the carriage to the rail.

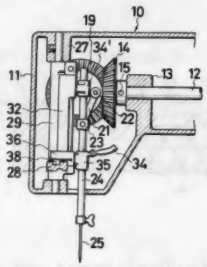
3,673,970
EARTHWORKING APPARATUS
John C. Hatcher, Charlotte, N.C., assignor to Cole Manufacturing Company, Charlotte, N.C.
Filed March 27, 1970, Ser. No. 23,155
Int. Cl. A01c *5/00*; A01b *61/04*
U.S. Cl. 111—85 **9 Claims**



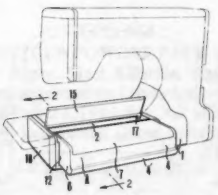
An earthworking apparatus which includes a supporting frame, a foot piece, preferably of bell crank configuration, pivotally suspended at one end thereof from the supporting frame, and having an earthworking tool operatively secured to the other end. A toggle mechanism interconnects the bell crank foot piece intermediate ends thereof with the supporting frame. Spring means are connected to the fulcrum of the toggle mechanism and restrainingly maintain the earthworking tool in an operative position and allows the toggle mechanism to trip upon encountering an excessive draft condition and move the earthworking tool to a non-earthworking inoperative position and urge the return of the earthworking tool to the operative position upon removal of the excessive draft condition.

3,673,971
ZIGZAG SEWING-MACHINE
Takeshi Ono, Kariya, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan
Filed Sept. 1, 1970, Ser. No. 68,604
Claims priority, application Japan, Sept. 4, 1969, 44/70139
Int. Cl. D05b *3/02*
U.S. Cl. 112—158 R **1 Claim**

A zigzag sewing machine equipped with a timing mechanism for the needle bar and hook to equalize the related positions both when the latter is to take the loop at any oscillated position of the needle, said timing mechanism comprising a crank rod connected to the rotatable gear and to the needle bar for imparting the vertical reciprocation to the needle bar in accordance with the lateral oscillation thereof.

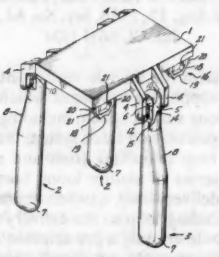


3,673,972
SEWING MACHINE WITH COMBINED ACCESSORY RECEPTACLE AND AUXILIARY BED
Kenneth H. Grange, London, England, assignor to Maruzen Sewing Machine Co., Ltd., Higashi-Mashi, Sata Moriguchi, Osaka, Japan
Filed July 16, 1970, Ser. No. 55,434
Claims priority, application Japan, Aug. 5, 1969, 44/661837
Int. Cl. D05b *75/00*
U.S. Cl. 112—258 **7 Claims**



A sewing machine having a space in the base thereof in which is received a removable receptacle for containing machine accessories. The receptacle constitutes part of the bed of the machine and may be moved outwardly of the recess to provide an extension of the work surface area of the bed of the machine. A foldable member is mounted at one end of the machine to serve as an extension of the work surface area of the bed of the machine.

3,673,973
CONVERTIBLE-FLOAT FLOATING PLATFORM
Lawrence R. Glosten, 71 Columbia St., Seattle, Wash.
Continuation of Ser. No. 821,715, May 5, 1969, abandoned.
This application March 29, 1971, Ser. No. 129,121
Int. Cl. B63b *35/00, 35/44*
U.S. Cl. 114—0.5 D **1 Claim**



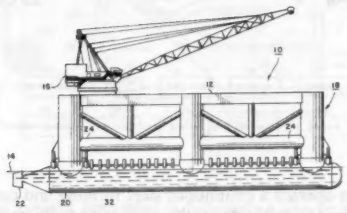
Elongated floats are connected adjacent to one end to opposite sides respectively of a floating platform with pivotal

connections enabling the floats at opposite sides of the platform to jackknife from upright positions into recumbent generally parallel positions with portions of the upper sides of the floats remote from their respective pivotal connections engaging saddles on the underside of the platform.

3,673,974
METHOD AND MOBILE MARINE PLATFORM APPARATUS HAVING FLOATING SUBMERGED MAT STABILIZATION

James C. Harper, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 872,314, Oct. 29, 1969, abandoned. This application March 17, 1970, Ser. No. 20,278
Int. Cl. B63b *35/00, 35/44*
U.S. Cl. 114—0.5 D **20 Claims**

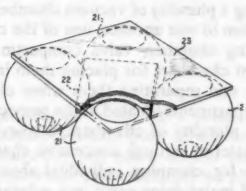


Three levels in a vertical plane, being an elevated work platform, a middle hull and a submersible lower hull are connected together by six telescoping vertical support columns. The lower catamaran hull consists of two pontoon-type tubes connected together by a mat having freeing holes therein to reduce the mat's resistance in the vertical plane when submerged. The middle hull is maintained above the water level when the lower hull is at the surface of the water, but settles down into the water to provide buoyant support when the lower hull is submerged. The lower hull, being buoyant and ballastable, is raised or lowered in the water by adding or removing water ballast. Action snubbers are provided to work in conjunction with the vertical columns to prevent any quick or fast relative movement between the lower hull and the combined middle hull and upper deck structure. An alternative embodiment utilizes the middle buoyant hull to floatably support a three column structure. Other alternative embodiments include non-telescoping columns, single column platform apparatus and means for varying the amount or number of freeing holes used to affect the mat resistance in the water.

3,673,975
FLOATING PLATFORM

Erwin S. Strauss, 1015 Laguna St., Suite 10, Santa Barbara, Calif.

Filed Jan. 26, 1970, Ser. No. 5,486
Int. Cl. B63b *35/44*
U.S. Cl. 114—43.5 **9 Claims**

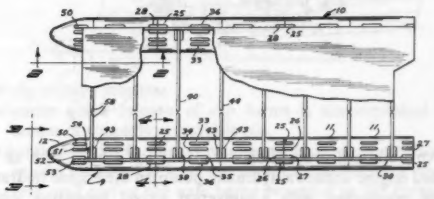


A floating platform including a plurality of air cells for supporting the platform is described. Each air cell is formed of a large, circular piece of a heavy gauge polyethylene type of material. The material is "pursed" and inverted so that the trapped air cannot escape through the opening remaining after the pursing operation. In addition, means are provided for adding air to the air cells when they contain an insufficient amount of air. The air cells are protected and maintained in position by a skirt that hangs downwardly from the outer edges from the platform. A building or other suitable structure is constructed on the platform. In addition, swingable stairs are provided for mounting the platform from the water level. Further a secondary polyethylene liner is located inside each of the air cells and is deployed if the primary air cell develops a leak.

3,673,976
SECTIONALIZED PONTOON APPARATUS

Richard W. Reynolds, 110 Mayo Drive, Burnsville, Minn.

Filed Nov. 21, 1969, Ser. No. 878,627
Int. Cl. B63b *35/38*
U.S. Cl. 114—61 **16 Claims**

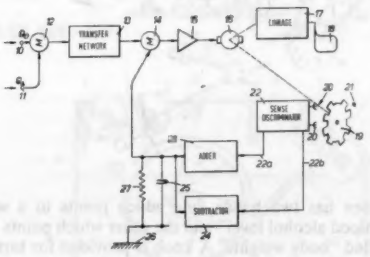


A pontoon boat, raft, dock or the like made from a plurality of pontoon sections having longitudinally extending tabs and transversely extending tabs, stringers bolted to longitudinally aligned longitudinal tabs, cross pieces bolted to the transverse tabs and a deck. Other than for the nose cone section for a boat, the pontoon sections have slotted end portions to receive a block to minimize twisting of adjacent pairs of pontoon sections. Further, the nose cone sections are interchangable and each of the other pontoon sections are of the same construction.

3,673,977
AUTOMATIC STEERING SYSTEMS

Dennis Alfred Hendley, London, England, assignor to Decca Limited, London, England

Filed Oct. 19, 1970, Ser. No. 81,669
Int. Cl. B63h *25/04*
U.S. Cl. 114—144 **3 Claims**



A steering system for a seagoing vessel includes a motor which drives a rudder in accord with a command signal formed by combining a steering signal and a feedback signal representing an integration of the driving movements of the

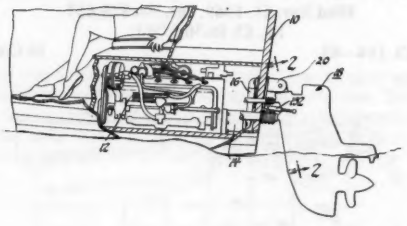
motor. The feedback signal is held in a capacitor which is associated with a leakage resistor so that the feedback signal automatically decreases independently of the movements of the rudder. The system permits a rapid response of the system for ordinary maneuvers and long term compensation for the effects of asymmetric loads or strong tides.

3,673,978

OUTBOARD DRIVE UNIT FOR BOATS

Robert W. Jeffery, Franklin; Robert A. Brown, Jr., Goodrich, and Allen F. Cullen, Grosse Pointe Farms, all of Mich., assignors to Sperry Rand Corporation, Troy, Mich.

Filed Aug. 12, 1970, Ser. No. 63,243
Int. Cl. B63h *25/42*
U.S. Cl. 115—35 **10 Claims**



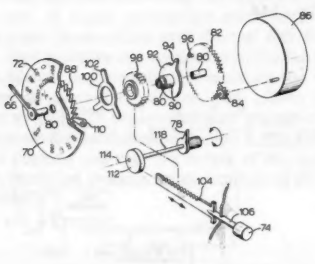
An outboard propulsion drive unit for a boat with an inboard engine utilizes a hydraulic pump on the engine hydraulically connected with a universal swivel mounting which receives an outboard propulsion unit to provide steering about a generally vertical axis and up-tilt motion about a transverse horizontal axis. The swivel mounting has a pair of hydraulic conduits extending through the bearing journals of both axes. The propulsion unit has a hydraulic motor geared to drive the propeller. A reservoir and a charging pump are mounted in the propulsion unit, the latter driven by the hydraulic motor.

3,673,979

ALCOHOL LEVEL INDICATOR

Hans Kunov, Toronto, Ontario, Canada, assignor to said Gordon, by said Kunov, Toronto, Ontario, Canada

Continuation-in-part of Ser. No. 94,255, Dec. 2, 1970, abandoned. This application Oct. 27, 1971, Ser. No. 192,888
Int. Cl. G09f *9/00*
U.S. Cl. 116—129 **7 Claims**



The device has two hands, one which points to a scale labelled "blood alcohol level" and the other which points to a scale labelled "body weight." A knob is provided for turning the "body weight" hand to the subject's weight and a second knob is provided for registering drinks consumed. Upon consumption of each drink, the subject presses the second knob. In one embodiment of the invention, pressing of the second knob causes the "blood alcohol level" hand to advance an increment and in the other embodiment the "blood alcohol level" scale incrementally advances. An adjustment means cooperates with the second knob to limit the advance of the hand or scale according to the subject's weight so that immediately following the advance, the "blood alcohol level" hand points to the approximately true alcohol level in the subject's blood stream. A watch-like mechanism regresses the hand or scale at a constant rate corresponding to the rate of disappearance of alcohol from the blood stream.

3,673,980

PROTECTIVE AND SUPPORTING MEANS FOR APPARATUS FOR CONTINUOUSLY COATING STEEL STRIP

Theodore H. Krengel, 637 Park Drive, Flossmoor, Ill., and Richard L. Pool, 3101 W. 173rd St., Hazelcrest, Ill.

Filed Oct. 30, 1970, Ser. No. 85,487
Int. Cl. B05c *11/00*
U.S. Cl. 118—6 **15 Claims**

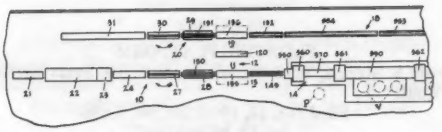
In order to operate a continuous steel forming and coating line at high speeds, supports for the moving steel are provided at various points such as at a location where it has its surface prepared to receive the coating and at the coating station. In addition, means are provided to shut down the line in the event there is a jam or binding causing the steel to buckle or bend creating a hazard.

3,673,981

FILMING APPARATUS

Robert R. Beckham; Emmett L. Walters; Jack G. Brown; Kenneth M. De Rose, and Joseph D. Ryan, all of Toledo, Ohio, assignors to Libbey-Owens-Ford Company, Toledo, Ohio

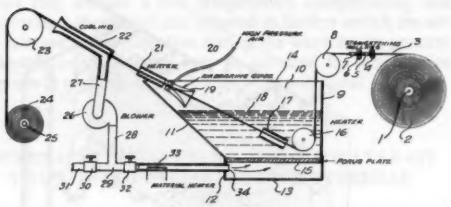
Division of Ser. No. 664,440, Aug. 30, 1967, Pat. No. 3,495,724, which is a continuation-in-part of Ser. No. 568,514, July 29, 1966, abandoned. This application May 13, 1969, Ser. No. 862,998
Int. Cl. B05c *11/00*
U.S. Cl. 118—6 **68 Claims**



System for the vacuum deposition of thin films on sheet material including a plurality of vacuum chambers arranged in end-to-end relation to one another, one of the chambers constituting a filming chamber, valve compartments disposed between adjacent chambers for placing them in communication when open and separating them when closed together with similar compartments located at the respective entry and exit ends of the plurality of chambers, conveying means for moving sheet material through successive chambers and including carriers for clamping individual sheets along their upper edges and maintaining same in a substantially vertical position, means responsive to the positioning of the material in the chambers to permit opening and closing of the valve compartments in predetermined sequence, and means outwardly

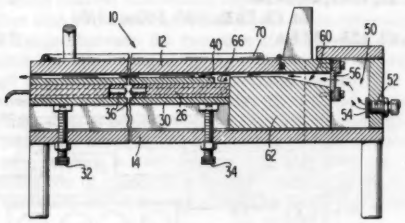
of the entry and exit valve compartments for aligning and positioning the sheet material for travel through the chambers and subsequent unloading thereof.

3,673,982
WIRE COATING PROCESS AND APPARATUS
Nolan W. Rutledge, Rt. 1, P.O. 700, Fort Lauderdale, Fla.; Ronald H. Mercer, 2900 Floral Road, Lake Worth, Fla., and Herbert Charles Hill, Jr., 213-12th Terrace, Indialantic, Fla.
Filed Dec. 30, 1969, Ser. No. 889,042
Int. Cl. B05b *1/24*
U.S. Cl. 118—641 **10 Claims**



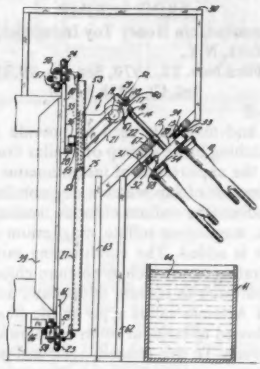
The present apparatus is for coating one or more strands with fusible particles, which strands are fed in a continuous manner into the open top of a chamber having a fluidized bed of coating particles therein and which strands are heated in their travel to said fluidized bed whereby said particles are fused on said strands building up a coating on the strands which are fed from the open top of said chamber each through an air bearing guide to a heater, cooler and then to a take-up roll therefor.

3,673,983
HIGH CAPACITY DEPOSITION REACTOR
Kurt Strater, Brookside; William Bernard Hall, Belle Meade; Eugene Michael Mihalick, Flemington, all of N.J., and William Charles Stever, Kellers Church, Pa., assignors to RCA Corporation
Filed April 27, 1970, Ser. No. 32,301
Int. Cl. C23c *13/08*
U.S. Cl. 118—48 **1 Claim**



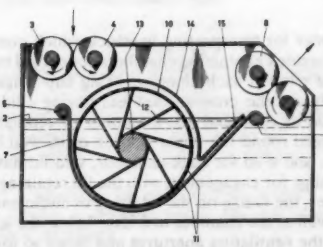
A deposition reactor including a housing having a gas passageway therein. A heater plate forms the bottom surface of the gas passageway and has a heated surface within the passageway upon which substrates may be placed. Means are provided for passing a flow of gas with a controlled turbulence in a laminar mode over the substrates, while the housing and passageway are cooled so that only the heater plate and the substrates are at the elevated temperature.

3,673,984
DIP COATING MACHINE
Raymond Francis Coulombe, Milford, Conn., assignor to Dart Industries Inc., Los Angeles, Calif.
Filed Aug. 28, 1970, Ser. No. 67,881
Int. Cl. B05c *3/00*
U.S. Cl. 118—416 **6 Claims**



A dip coating machine:
wherein quick release of dip forms is accomplished by means of a rapidly removable pin,
wherein the dip form may be oriented about its rotational axis by means of at least two pinions mounted to a single axle, one end of the axle being mounted to the form, at least one of the pinions having a toothless peripheral portion and a rack mounted to the frame for each pinion so that movement of the form along the rack causes the pinions to roll in their respective rack thus causing the form to rotate and so that a pinion having a toothless portion will stop rotating at a predetermined position when it has rotated so that its toothless portion faces its rack, provided the other racks have gaps at that point; and
wherein a plurality of forms may be lowered into and removed from a dipping solution by a single mechanism while permitting each form to be individually rotated by means of a separate axle for each form passing through a movable block, each axle being provided with an individual rotating device.

3,673,985
DEVELOPMENT APPARATUS FOR ELECTROPHOTOGRAPHIC COPIES
Wilhelmus Emilius Maria Dols, Venlo, Netherlands, assignor to Van Der Grinten N.V., Venlo, Netherlands
Filed June 18, 1970, Ser. No. 47,524
Claims priority, application Netherlands, June 24, 1969, 6909655
Int. Cl. G03g *13/00*
U.S. Cl. 118—637 **4 Claims**



An apparatus for liquid developing of electrophotographic copies has a passage for the copies through the liquid in the

reservoir, said passage being bordered on one side by a hollow rotating cylinder having internal blades for pumping the liquid through openings in the cylinder into said passage.

3,673,986
METHOD AND MATERIALS USED FOR HATCHING BRINE SHRIMP

Harold N. Braunhut, c/o Honey Toy Industries, Inc. 200 Fifth Ave., New York, N.Y.

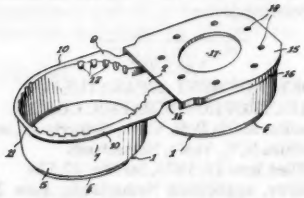
Filed Nov. 12, 1970, Ser. No. 89,034
Int. Cl. A01k *61/00*
U.S. Cl. 119—2 **10 Claims**

A method and materials used to provide an aquatic life habitat for hatching brine shrimp or similar crustaceans in tap water to give the appearance of instantaneous hatching. To a convenient amount of tap water a dry conditioning mixture comprising iodine-free sodium chloride, sodium sulfate, sodium carbonate, magnesium sulfate, magnesium chloride, potassium chloride is added. The conditioning mixture also contains a dehydrating agent such as calcium chloride, a chlorine removing agent such as sodium thiosulfate, and a quantity of dried eggs of Artemia salina type or the like. The aqueous medium is allowed to stand at room temperature for a period of 24 to 36 hours. To this treated, aged and purified aqueous habitat medium, a second mixture comprising magnesium sulfate, borax and sodium crystals, yeast, additional dried eggs, a dehydrating agent and a water-soluble dye is added.

3,673,987
LIVESTOCK CONTAINER

Clive R. Fletcher, Colchester, England, assignor to Bakelite Xylonite Limited

Filed July 15, 1970, Ser. No. 54,923
Claims priority, application Great Britain, July 18, 1969, 36,288/69
Int. Cl. A01k *1/02, 31/18*
U.S. Cl. 119—19 **10 Claims**

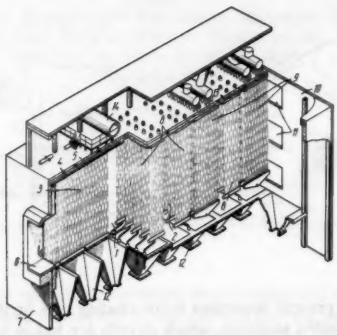


A container for transporting livestock which comprises at least two livestock containing chambers connected together in side-by-side relation each chamber being cup-shaped and of substantially circular cross-section and having a lid-retaining flange round its open end and a number of ventilation apertures arranged round the upper portion of its wall below the said flange, and a lid for each chamber, said lid having a dependent flange for engagement with the lid retaining flange of the chamber, the flange on the lid being of sufficient depth to cover the wall of the chamber to a level below the level of the bottom of the ventilation apertures and being so formed that when the chamber is covered with the lid a space through which air can flow into the chamber via the apertures is left between the wall of the chamber and the flange on the lid.

3,673,988
EXHAUST HEAT BOILER

Zalman Leivikovich Berlin; Oleg Nikolaevich Bagrov, both of Moscow; Gennady Vasilievich Maslovsky, Belgorod; Anatoly Gavrilovich Serkov, Belgorod, and Viktor Yakovlevich Yakimovich, Belgorod, all of U.S.S.R., assignors to Gosudarstvenny naucho-issledovatelsky institut tsvetnykh metallov, Moscow and Belgorodsky Kotlo-Stroitelny Zavod, Belgorod, U.S.S.R.

Filed Feb. 10, 1971, Ser. No. 114,318
Int. Cl. F22b *1/18*
U.S. Cl. 122—7 R **2 Claims**



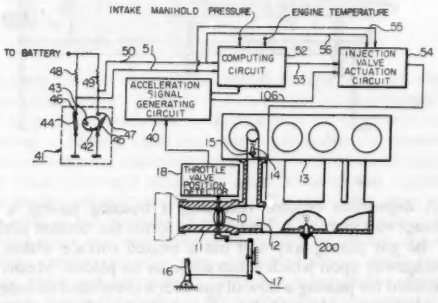
The invention relates to an exhaust heat boiler used in conjunction with the furnaces for sintering or melting sulphide ores and concentrates.

A characteristic feature of the boiler consists in making some of the evaporating and blowoff tubes of the evaporator platens from two coaxial tubes. Besides, the holes for the discharge of the cooled gas are arranged in at least one vertical row in the rear end wall of the boiler.

3,673,989
ACCELERATION ACTUATING DEVICE FOR FUEL INJECTION SYSTEM

Shigeo Aono; Nobuzi Manaka, both of Yokosuka; Tokuichi Inagaki, Yokohama; Yasuo Nakajima, Yokosuka, and Yukihiro Etoh, Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Oct. 19, 1970, Ser. No. 81,864
Claims priority, application Japan, Oct. 22, 1969, 44/84428; Oct. 22, 1969, 44/84538; Oct. 22, 1969, 44/84539; Oct. 22, 1969, 44/84540
Int. Cl. F02b *3/00;* **F02m** *13/04*
U.S. Cl. 123—32 EA **7 Claims**



An acceleration device adapted for incorporation into an automobile fuel injection system so as to provide for an instan-

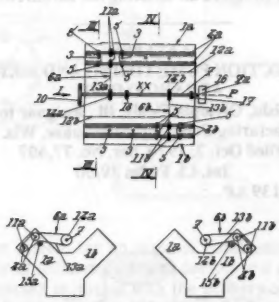
taneous increase in the quantity of injection fuel supplied to the individual cylinders. A throttle valve position detector or intake pressure sensor is adapted to detect the driver's effort to effect acceleration. An acceleration signal generating circuit is connected to the throttle valve position detector or intake pressure sensor, so that upon detection of the driver's effort the circuit generates a first and second acceleration signals. The first acceleration signal is supplied to an injection valve actuation circuit so as to energize the injection valve, thereby providing an enriched air-fuel mixture for acceleration. The second acceleration signal is applied to a computing circuit to increase the width of an injection pulse signal generated thereby. The increase in the width of the injection pulses also causes the increase in the quantity of injection fuel supplied to the cylinders. The acceleration signal generating circuit may include a low temperature compensating unit comprising a thermistor and adapted to further enrich the air-fuel mixture for acceleration during the warming-up process. A starting injection valve may be actuated for acceleration purposes in response to the first acceleration signal.

3,673,990

INTERNAL COMBUSTION ENGINES WITH AT LEAST TWO ROWS OF CYLINDERS WITH OVERHEAD CAMSHAFTS

Giulio Alfieri, Modena, Italy, assignor to Officine Alfieri Maserati, Modena, Italy

Filed Aug. 20, 1970, Ser. No. 65,431
Claims priority, application Italy, Aug. 25, 1969, 4752 A/69
Int. Cl. F01l 1/00; F02b 75/22
U.S. Cl. 123—52 R **3 Claims**



A V-form internal combustion engine includes two rows of cylinders with overhead camshafts driven by an intermediate shaft arranged between the two rows of cylinders parallel to the latter and itself rotated by the crankshaft of the engine through a generally reducing transmission device. The two transmission devices include two drive gears keyed on the intermediate shaft at positions selected so that the corresponding driven gears borne by the camshafts are situated between two cams relating to two successive cylinders of the corresponding row of cylinders, whereby reduction in the length of the camshafts and in the engine cylinder heads is effected.

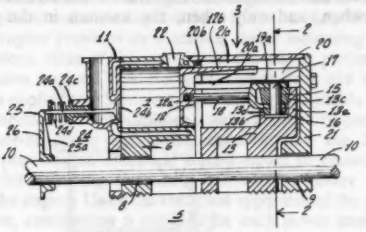
3,673,991

INTERNAL COMBUSTION ENGINE

John Winn, 4423 N. Sheridan Road, Chicago, Ill.

Filed May 22, 1970, Ser. No. 39,930
Int. Cl. F02b 75/26
U.S. Cl. 123—58 A **2 Claims**

The detailed description and specification of this invention discloses a new four-stroke cycle internal combustion engine which is a new combination of previously used practices and a new method of inducting a charge into a cylinder in the course of an intake stroke. This method inducts a much greater charge, at a given high speed of the engine, than that inducted into any of today's engines of the same displacement, without



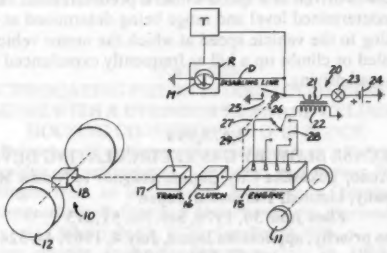
the use of a supercharger, and eliminates the intake valves and the valve linkage used in conventional engines.

3,673,992

COMBINED TACHOMETER AND MAXIMUM SPEED LIMITING DEVICE

Vernon C. Westberg, 22 S. State, Elgin, Ill.

Filed Feb. 8, 1971, Ser. No. 113,170
Int. Cl. F02p 9/00
U.S. Cl. 123—118 **17 Claims**



A combined tachometer and maximum speed limiting device for cutting off the engine of a hot rod vehicle for a predetermined short time interval upon reaching a predetermined limiting speed to signal to the driver that the transmission should be shifted to the next higher gear and to provide time to make the shift. A tachometer receiver in the form of a meter type relay provides contacts which are closed at a set maximum engine speed. The meter coil is energized by variable direct voltage from a tachometer transmitter which is coupled to the primary of the ignition coil of the vehicle. Closure of the meter contacts energizes an output relay having contacts which are connected to short out the ignition system. Capacitor discharge means are provided for insuring positive closure of the meter contacts and for delaying drop-out of the output relay for a predetermined but adjustable time interval. In an alternate embodiment means are provided for cutting out the engine until intentionally reset.

3,673,993

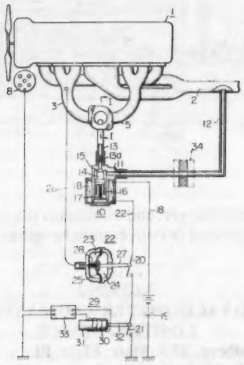
AIR-POLLUTION PREVENTIVE SYSTEM FOR MOTOR VEHICLES

Yasuo Nakajima, Yokosuka; Yoshimasa Hayashi, and Kunihiko Sugihara, both of Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jan. 19, 1970, Ser. No. 3,783
Claims priority, application Japan, Jan. 20, 1969, 44/3498; July 31, 1969, 44/60028
Int. Cl. F02m 25/06
U.S. Cl. 123—119 A **4 Claims**

An air-pollution preventive system for use with an internal combustion engine of motor vehicles, which system is adapted

to reduce the concentration of nitrogen oxides in the exhaust gases emitted from the engine during the city-road driving of the motor vehicle, wherein the exhaust gases are recirculated from the exhaust manifold into the intake manifold and cooled therein when, and only when, the vacuum in the intake



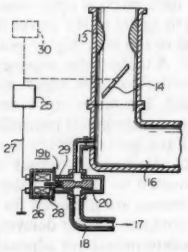
manifold is lower than a predetermined level and concurrently the engine is driven at a speed within a predetermined range, such predetermined level and range being determined as corresponding to the vehicle speed at which the motor vehicle is accelerated or climbs up a hill as frequently experienced during city-road driving.

3,673,994

CRANKCASE BLOW-BY GAS RECIRCULATING DEVICE

Shigeo Aono, Yokosuka City, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed June 30, 1970, Ser. No. 51,293
Claims priority, application Japan, July 4, 1969, 44/52472
Int. Cl. F02m *7/00*
U.S. Cl. 123—119 B **5 Claims**



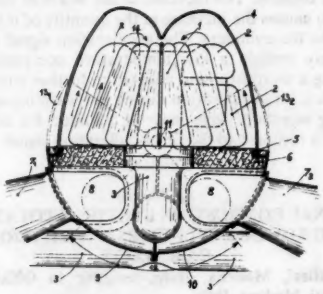
A crankcase blow-by gas recirculating device which is adapted to interrupt the recirculation of the blow-by gases from the engine crankcase to the combustion chambers during deceleration and idling when the quantity of unburned hydrocarbons in the engine exhaust gases significantly increases, which device is provided with flow regulating means comprising a valve element operatively interposed in the blow-by gas recirculating passage and means detecting the decelerating and idling conditions and actuating the valve element when the decelerating or idling condition is detected. Such decelerating and idling conditions may preferably represented by the angular position of the throttle valve, vacuum in the intake manifold, vehicle speed, or any combination of these. The device of the invention may be used in combination with an internal combustion engine having a carburettor or having, in lieu of the carburettor a fuel injection system.

3,673,995

INDUCTION AIR TEMPERATURE REGULATORS

Jean-Pierre Mangin, Billancourt, France, assignor to Regie Nationale Des Usines Renault, Billancourt and Automobiles Peugeot, Paris, France

Filed May 18, 1970, Ser. No. 38,363
Int. Cl. F02m *31/06, 15/00*
U.S. Cl. 123—122 D **9 Claims**



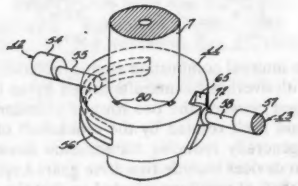
Induction air temperature regulator for internal combustion engines, wherein the carburetor is enclosed in a bell-shaped casing, the air sucked through the base of said casing flowing upwards through an annular filter element and along the outer surface of the carburetor, thus ensuring a heat exchange therewith before being sucked through the carburetor to form the combustion mixture. Spherical shutters surround the lower portion of the bell casing and are movable to control the ratio of heated/unheated air entering the carburetor.

3,673,996

FUEL INJECTION PUMP TIMING AND METERING ARRANGEMENT

Alexander Dreisin, Olympia Fields, Ill., assignor to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

Filed Oct. 2, 1970, Ser. No. 77,407
Int. Cl. F02m *39/00*
U.S. Cl. 123—139 AP **10 Claims**



A fuel injection pump for an internal combustion engine having a control sleeve operated by separate metering and timing control elements.

3,673,997

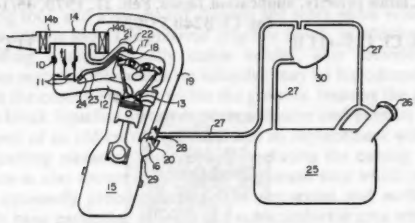
AIR-POLLUTION PREVENTING SYSTEM

Hiraki Sawada, Tokyo, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Feb. 8, 1971, Ser. No. 113,204
Claims priority, application Japan, Feb. 13, 1970, 45/12349
Int. Cl. F02m *59/00*; F02b *33/00*
U.S. Cl. 123—136 **4 Claims**

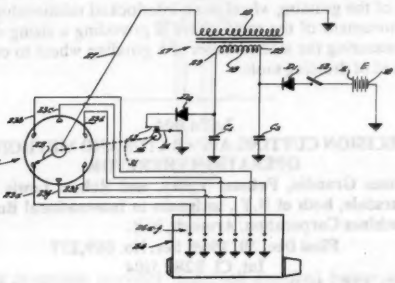
An air-pollution preventive system for an internal combustion engine of a motor vehicle, adapted to eliminate the

evaporative gases emitted from the fuel storage tank into the atmosphere for thereby reducing air pollution. The evaporative gases produced in the fuel storage tank are introduced to the crankcase of the engine and admitted to the combustion



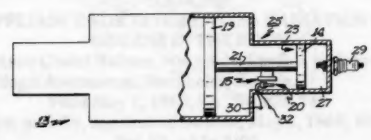
chamber of the engine through the carburetor of the engine together with the blow-by gases in the crankcase. The flow of the evaporative losses into the crankcase is controlled by valve means adapted to be responsive to pulsations in the pressure in the crankcase of the engine.

3,673,998
ELECTRONIC IGNITION
John P. Phillips, 625 Esther St., Michigan City, Ind.
Filed June 11, 1970, Ser. No. 45,300
Int. Cl. F02p 1/00
U.S. Cl. 123—148 E **4 Claims**



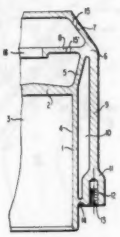
An ignition system for an internal combustion engine including a pair of unilateral current devices and a pair of condensers connected in circuit with the primary of the ignition coil so as to obtain an improved ignition system.

3,673,999
ELECTRICAL APPARATUS FOR INITIATING COMBUSTION IN FREE PISTON ENGINES
James G. Lacy, and John V. Byrne, both of Dublin, Ireland, assignors to Anton Braun, Minneapolis, Minn.
Filed Aug. 24, 1970, Ser. No. 66,215
Int. Cl. F02p 1/00
U.S. Cl. 123—149 H **11 Claims**



Electrical apparatus is disclosed for initiating and controlling combustion in free piston engines having a power piston freely reciprocating within a power cylinder of the engine and alternately expanding and compressing gases in a combustion chamber within the power cylinder. A velocity probe in the form of a magnet arranged to move with the power piston and a sensing coil fixed to the housing of the free piston engine provides an electrical signal indicating the instantaneous value of the velocity of the power piston of the free piston engine. This electrical signal from the velocity probe is applied to a Schmitt trigger through a suitable electrical connection such as a voltage divider network or preferably a resistor-capacitor and diode network, and the Schmitt trigger provides an electrical timing signal to conventional means for initiating successive combustion power strokes within the engine. Using the electrical apparatus of the present invention, combustion is initiated for each power stroke at a point in time related to the velocity of the power piston, and thus to the time at which the power piston reverses direction, without the necessity of regard to the physical position, i.e., linear location, of the power piston along its path of movement within the power cylinder. Specifically, the Schmitt trigger is set in one condition when the piston velocity increases to a predetermined level as the piston accelerates during the first part of its movement toward a firing position. Then, as the piston slows down while approaching its reversal for the start of the power stroke, the decrease in piston velocity to a predetermined level sets the Schmitt trigger in another condition to cause a spark igniting another combustion initiating action. Additional electrical circuitry is included which may be used to aid in starting free piston engines.

3,674,000
RECIPROCATING PISTON INTERNAL COMBUSTION ENGINE WITH A CYLINDER HEAD AND CYLINDER HOUSING CONSISTING OF ONE BLOCK
Josef Reisacher, Wendlingen (Neckar); Frederich Noltemeyer, Schmiden (Wurttemberg), Germany, and Reiner Dziggel, Esslingen-Weil, all of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart-Untertuerkheim, Germany
Filed July 21, 1970, Ser. No. 56,860
Claims priority, application Germany, July 26, 1969, P 19 38 133.0
Int. Cl. F02f 1/20
U.S. Cl. 123—193 CH **14 Claims**



A reciprocating piston internal combustion engine with a cylinder head and a cylinder housing consisting of one single block, in which the cylinder housing essentially consists of an inner wall defining together with a cylinder head bottom the cylinder space and of an outer wall separated from the inner wall by a cooling space; the cylinder housing is connected with the crankcase by way of bolts or the like whose center longitudinal axes are disposed in or very close to the center of the outer wall while the outer wall extends up to connecting places disposed above the cylinder head bottom; the cylinder head bottom is supported at these connecting places by way of support walls.

3,674,001

ARCHERY BOW IN COMBINATION WITH DRAW FORCE MULTIPLYING MEANS

Otis H. Hitt, Archbold, Ohio, assignor to Hit Archery Co., Inc., Archbold, Ohio

Filed Dec. 3, 1970, Ser. No. 94,723
Int. Cl. F41b *5/00*
U.S. Cl. 124—24 4 Claims

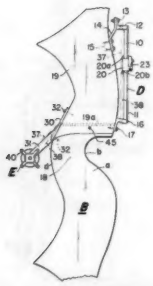
An archery bow having master limbs with auxiliary limbs extending from the belly side of the bow to a position rearwardly of the master limbs. The auxiliary limbs are positioned so as to resist the flexing of master limbs during the draw of a bow string, and thus increase the projectile propelling force of a bow.

3,674,002

ADJUSTABLE ARCHERY SIGHT

Clyde Diamond, Sr., R.D. #1, Box 234, Rices Landing, Pa.

Filed Oct. 19, 1970, Ser. No. 81,817
Int. Cl. F41b *5/00*
U.S. Cl. 124—30 R 9 Claims



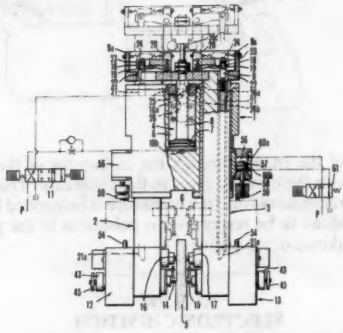
Sighting mechanism is provided that enables an archer to make a variable sight adjustment while holding the bow in one hand and gripping an arrow as tensioned by the bow string with the other hand. The sighting mechanism has a vertically movable sighting member mounted on the belly of a bow and a reel or drum mounted on the back of a bow. Connected between the sighting member and the reel are two filaments. One filament operates on the sighting member to move it upwardly when the reel or drum is rotated in one direction, and the other filament operates on the sight member to move it downwardly when the reel is rotated in the opposite direction.

3,674,003

APPARATUS FOR DRESSING GRINDING WHEELS

Ichizo Kakumu, and Susumu Oshima, both of Aichi, Japan, assignors to Toyoda Koki Kabushiki Kaisha, Aichi-ken, Japan

Filed Feb. 2, 1971, Ser. No. 111,843
Claims priority, application Japan, Feb. 21, 1970, 45/14696
Int. Cl. B24b *53/02*
U.S. Cl. 125—11 H 11 Claims



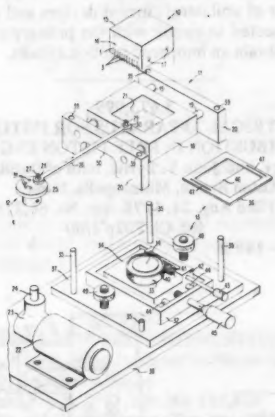
In apparatus for dressing the opposite surfaces of a grinding wheel comprising rams mounted to be slidable along the opposite side surfaces of the grinding wheel, feed means for feeding dressing tools mounted on the rams toward the side surfaces of the grinding wheel in an interlocked relationship with the movement of the rams, there is providing a sizing device for measuring the side surfaces of a grinding wheel to control the feed of dressing tools.

3,674,004

PRECISION CUTTING APPARATUS AND METHOD OF OPERATION THEREFOR

Johannes Grandia, Putnam Valley, and Robert Lewis Rohr, Scarsdale, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1969, Ser. No. 889,277
Int. Cl. B28d *5/04*
U.S. Cl. 125—16 R 4 Claims



A precision cutting apparatus including a cutting tool which consists of at least a single flexible cutting element and means coacting with said cutting element for holding it in a rigid, un-

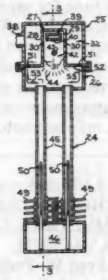
stressed condition is disclosed. The flexible cutting element is ordinary spring steel while the means for holding the cutting element in a rigid, unstressed condition is a block of dimensionally-stable pyrolytic graphite containing a groove in which the spring steel cutting element is receivable. Also disclosed, is translation means for applying rectilinear motion to the cutting tool, and a means for aligning the work piece relative to the cutting tool. The grooved graphite block, in addition to providing a dimensionally stable holder, also provides a porous material into which an adhesive may be introduced to retain the cutting element within the grooves. Heating the graphite block liquefies an appropriate adhesive and permits the removal of an old cutting element and its replacement with a new cutting element. A method of operating the cutting apparatus is also shown including an alignment step which permits extremely precise cutting. The apparatus and method taught have particular utility in the semiconductor area where the ability to dice with great precision, for example, greatly enhances the yield of usable semiconductor chips.

3,674,005

GAS-FIRED SPACE HEATER MEANS

Richard C. Barnett, Tyler; Joe W. Dark, Flint, both of Tex., and James L. Schulze, Sr., Louisville, Ky., assignors to General Electric Company, by said Barnett and Dark

Filed Sept. 30, 1970, Ser. No. 76,671
Int. Cl. F24h *3/02*
U.S. Cl. 126—91 A **20 Claims**



This invention provides improved gas-fired heater means for supplying heat to a space, such as a room, house, building or the like. The space heater means include highly efficient heat exchanger means for transferring heat generated by the combustion of a fuel gas-air mixture to an air stream circulated between the heat exchanger means and the space, in combination with pressurized combustor means for mixing fuel gas with pressurized combustion air and igniting that mixture to produce a highly intense heat source flame which is discharged into the heat exchanger means inlet through hollow interconnecting conduit means. The present invention provides novel means for directing a heat-insulating layer of pressurized fluid between the flame and interior surfaces of the interconnecting conduit means such that these conduit surfaces are protected by the fluid layer against adverse heat-fatiguing action by the intensely hot flame.

3,674,006

APPLIANCE FOR INTERSTITIAL RADIATION OF ORGANS IN THE BODY

Bernt Arne Gustaf Holmer, Nykoping, Sweden, assignor to Aktiebolaget Atomenergi, Stockholm, Sweden

Filed May 1, 1969, Ser. No. 820,740
Claims priority, application Sweden, May 2, 1968, 5953/68
Int. Cl. A61n *5/00*
U.S. Cl. 128—1.2 **2 Claims**

An appliance for the interstitial radiation of organs in the body of man or animals comprises a cannular tube which contains a radioactive compound and which is attached to the end of a rod provided with a handle. A sheath can be adjustably displaced along the cannular tube and rod and is arranged to

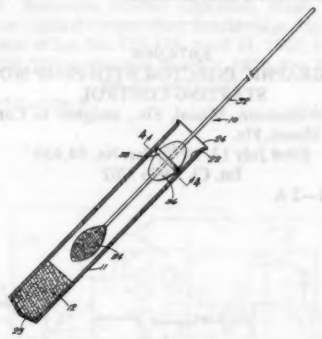
tightly surround the tube and rod. The sheath is radiation-absorbing at least at the outer part, which can be brought to cover, more or less, the radioactive compound in the cannular tube.

3,674,007

CULTURE COLLECTING APPARATUS

John H. Freis, 3111 Sunnyside Drive, Rockford, Ill.

Filed June 4, 1970, Ser. No. 43,361
Int. Cl. A61b *7/24, 17/42, 17/50*
U.S. Cl. 128—2 **3 Claims**

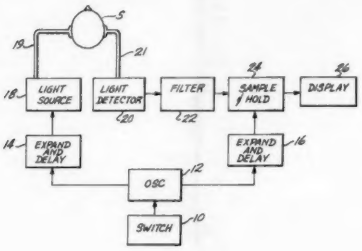


A tube contains a plug of absorbent material saturated with a culture-sustaining liquid. A swabbing unit includes an elongate member carrying a swabbing tip at one end and providing a handle at the other. Intermediate the ends is a sealing member designed to seal against the elongate member and against the inside of the tube. The swabbing unit can be withdrawn from the tube, a culture collected on the tip, and the tip replaced in the tube which is sealed by the sealing member. The liquid moistens the swabbing tip and keeps the collected culture in a live condition until laboratory tests have been performed on the culture.

3,674,008
QUANTITATIVE PULSED TRANSILLUMINATOR AND METHOD OF OPERATION

Curtis C. Johnson, Lynnwood, Wash., assignor to The Battelle Development Corporation, Columbus, Ohio

Filed July 13, 1970, Ser. No. 54,285
Int. Cl. A61b 5/00
U.S. Cl. 128—2 A 18 Claims

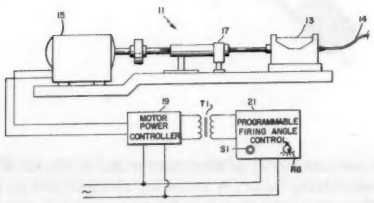


An instrument is described which quantitatively measures optical density of the transilluminated body portion. The instrument comprises a controllable, relatively low-frequency oscillator generating pulses which are applied to a light source through a first expand and delay circuit. A light-conducting means, such as a fiber optic device, optically couples the light source to one side of the body portion and a similar means optically couples another side of the body portion to a light detector. Alternatively, the light source and detector may be placed directly on the body portion. After compensation for ambient light, the output of the detector is coupled to a sample and hold circuit which is triggered by the controllable oscillator through a second expand and delay circuit. The stored signal in the sample and hold circuit is proportional to transmittance and is converted to a visual indication of optical density by a calibrated display means. Methods of using the instrument in diagnosis are discussed, as are further applications to spectrophotometric determinations.

3,674,009
ANGIOGRAPHIC INJECTOR WITH PUMP MOTOR STARTING CONTROL

Donald E. Williamson, Miami, Fla., assignor to Cordis Corporation, Miami, Fla.

Filed July 13, 1970, Ser. No. 54,430
Int. Cl. A61b 5/02
U.S. Cl. 128—2 A 2 Claims

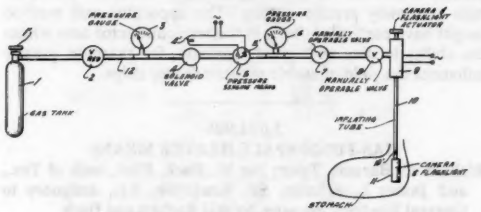


The angiographic injector disclosed herein employs a pump motor which is gradually and progressively energized to prevent whipping of the catheter tip. The energization of the motor is varied as a function of a control signal voltage which rises relatively gradually, the motor being energized from an a.c. source through a triggerable semiconductor current switching device whose firing angle is varied as a function of the amplitude of the control signal voltage.

3,674,010
APPARATUS FOR AUTOMATIC INFLATION OF CAVITIES OF THE BODY

John Falenks, Redhook, N.Y., assignor to Diversified Medical Corporation, Scarsdale, N.Y.

Filed July 15, 1970, Ser. No. 55,081
Int. Cl. A61b 1/00
U.S. Cl. 128—2 R 10 Claims

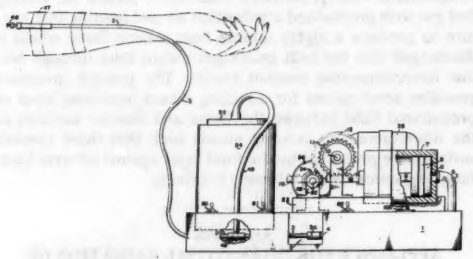


Apparatus for automatic inflation of cavities of the body, for instance the stomach, in which an inflating tube insertable with one end portion into the stomach is connected by a tube to a tank containing a gas under pressure and wherein sensing means cooperate with the tube for sensing the gas pressure in the stomach and automatically shut off further passage of gas under pressure into the stomach when the gas pressure in the latter has reached a predetermined value. The end of the inflating tube which is inserted into the stomach preferably carries a camera and illuminating means so that the interior of the body, after being inflated, may be photographed.

3,674,011
MEANS FOR AND METHOD OF TRANSFERING BLOOD FROM A PATIENT TO MULTIPLE TEST TUBES WITHIN A VACUUM

Raymond S. Michel, and Fred W. Podhora, both of Portland, Oreg., assignors to United Medical Laboratories Inc., Portland, Oreg.

Filed Jan. 12, 1971, Ser. No. 105,921
Int. Cl. A61b 05/00; A61m 01/00
U.S. Cl. 128—2 F 5 Claims



Apparatus for drawing and controlling blood flow from a single venipuncture through a flexible catheter into a sealed vacuumized container and simultaneous delivery to a number of test tubes within the container. The catheter is in open communication at one of its ends with a hypodermic needle and at its opposite end through a first flow control valve with the interior of the test tube container by means of a cap which

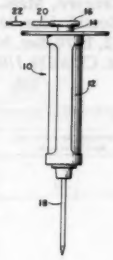
directs blood flow equally and simultaneously to the test tubes within the container.

3,674,012

BLOOD COAGULATION DETECTION DEVICE

Stanley J. Sage, Lexington, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Filed April 17, 1970, Ser. No. 29,563
Int. Cl. A61b 5/04
U.S. Cl. 128—2.1 R 16 Claims



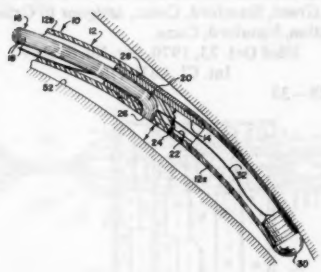
This apparatus for detecting the time of coagulation of liquid blood samples includes a hypodermic syringe having the necessary components mounted therein to perform this test. These components include a group of spatially separated electrodes which are disposed around the exterior surface of either the plunger or the base of the barrel where the cannula normally mounts to the hypodermic syringe. Means are provided for connecting the electrodes to an impedance monitoring circuit to ascertain the clotting time of the sample.

3,674,013

FIBEROPTIC CATHETER

Michael L. Polanyi, Webster, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Filed Sept. 30, 1970, Ser. No. 76,714
Int. Cl. A61b 05/02
U.S. Cl. 128—2.05 D 5 Claims



A fiberoptic catheter for monitoring blood in vivo with avoidance of thrombus formation. A standard cardiac catheter having longitudinally extending afferent and efferent light-conducting fibers therewithin is terminated with a smoothly rounded tip. Some distance back from the tip, the fibers are directed right-angularly to one side of the catheter where ends thereof are optically finished to form an exposed light-emitting and light-receiving face at said side of the catheter. This face is spaced from walls of passages of the recipient by a fixed bend in the adjacent terminal portion of the catheter.

3,674,014

MAGNETICALLY GUIDABLE CATHETER-TIP AND METHOD

Hans Tillander, Goteborg, Sweden, assignor to Astra-Meditec AB, Goteborg, Sweden

Filed Oct. 21, 1970, Ser. No. 82,620
Claims priority, application Sweden, Oct. 28, 1969, 14694/69
Int. Cl. A61m 25/00; A61b 05/02
U.S. Cl. 128—2.05 R 8 Claims

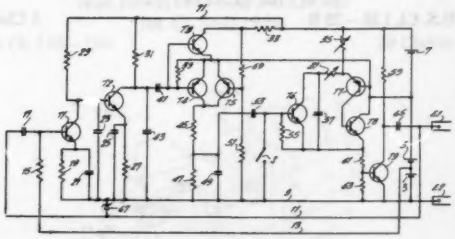
A flexible catheter-tip, guidable by a magnetic field into selected arteries of the body, includes a plurality of permanent magnetic tubular sections with ball-shaped ends arranged end-to-end. Each pair of adjacent ends is encased within a tubular link formed of non-magnetic material which provides a flexible, fluid-tight seal between the tubular sections. Each ball-shaped end has formed thereon a bevel to provide stability between adjacent sections, and therefore to the whole catheter-tip, at full bend.

3,674,015

RATE DISCRIMINATORY ELECTROCARDIOGRAPHIC MONITORING SYSTEM

Barouh V. Berkovits, Newton Highlands, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Division of Ser. No. 727,129, April 11, 1968, Pat. No. 3,528,428. This application March 4, 1970, Ser. No. 16,478
Int. Cl. A61f 5/04
U.S. Cl. 128—2.06 F 4 Claims



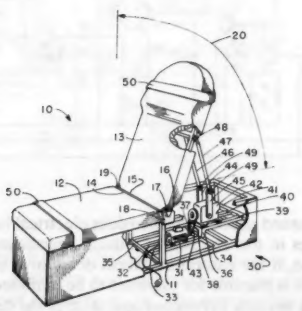
A demand pacer which provides electrical heart-stimulating impulses in the absence of natural heartbeats. In a pacer of this type, if the natural heartbeat detector is erroneously triggered, it is possible for impulses to be inhibited when they are actually needed. Erroneous operation of the detector in the invention is partially prevented by tuning it to the dominant frequencies in the electrical signal which is generated as a result of a localized ventricular depolarization. These frequen-

cies, however, are relatively close to 60 Hz, and thus 60 Hz stray signals might erroneously cut off the generation of impulses. For this reason, a capacitor charging circuit is provided in the detecting circuit. All input signals are processed so that the capacitor is fed by unipolar pulses. Pulses occuring at a 120 Hz rate (from the processing of stray 60 Hz signals) occur so rapidly compared to the discharge time constant of the capacitor circuit that the voltage across the capacitor does not change appreciably. Heartbeat signals, on the other hand, occuring at the much slower rate of approximately 72 per minute, allow the capacitor to discharge sufficiently after each charging pulse such that a large pulsating signal is developed across the capacitor. It is each pulsating signal which shuts off the generation of an impulse. In the presence of 60 Hz stray signals, the pacer functions in its continuous mode.

3,674,016
SHIELD FOR ENDOSCOPIC INSTRUMENTS
Gino Leucci, 4740 Castor Ave., Philadelphia, Pa.
Filed June 25, 1970, Ser. No. 49,756
Int. Cl. A61b 1/00
U.S. Cl. 128—4 **4 Claims**

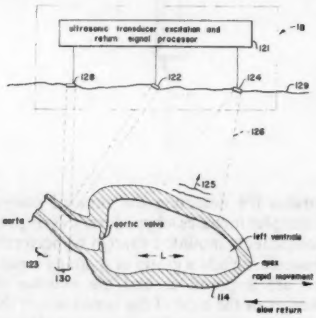
A shield for endoscopic instruments id described. Endoscopic instruments have an elongated, hollow member that has a front end adapted for insertion into the bladder through the urethra, and a back end having an opening that is adapted for receiving a viewing instrument. The shield is typically mounted at the back end of the endoscopic instrument such that it is in a non-interfering position when the viewing instrument is in place in the endoscopic instrument. When the viewing instrument is removed from the endoscopic instrument, the shield pivots to a protectively disposed position behind the opening at the back of the endoscopic instrument to deflect liquid that is ejected out through said opening.

3,674,017
APPARATUS FOR PASSIVELY EXERCISING A PERSON'S ABDOMINAL MUSCLES
Hugo Stefani, Jr., 917 La Veto N.E., Albuquerque, N. Mex.
Filed March 15, 1971, Ser. No. 124,194
Int. Cl. A61h 1/02
U.S. Cl. 128—25 R **5 Claims**



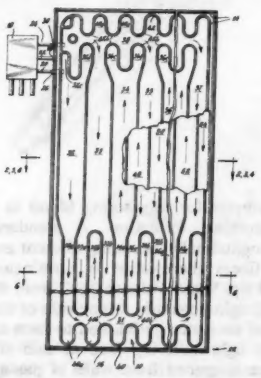
Apparatus for passively exercising a person's abdominal muscles including a stationary table and a reciprocating table, upon which the person to be exercised is disposed with a portion of his body on each table. The reciprocating table is then moved upward and downward to effectuate a 90° movement of the person to be exercised, from a prone position to a sitting position. The reciprocating table may be moved by an oscillating mechanism which includes a motor which drives a gear box, turning arms appropriately connected to the reciprocating table to change the rotary output from the gear box to reciprocate the table between the 0° and 90° positions.

3,674,018
ASSISTED CARDIOVASCULAR CIRCULATION
Herbert E. Goldberg, Concord, Mass., assignor to American Optical Corporation, Southbridge, Mass.
Filed Oct. 2, 1970, Ser. No. 77,662
Int. Cl. A61h 1/00
U.S. Cl. 128—33 **7 Claims**



Apparatus arranged to aid a patient's cardiovascular circulation by moving the patient synchronously and in proper phase with the pumping action of his heart to reduce the pumping load on his heart. An improved cardiovascular circulation aid is disclosed utilizing apparatus for providing an accurate indication of the occurrence of onset of systole and where body movement is precisely synchronized thereto. Apparatus for phasing the onset of systole with the beginning of movement of the patient includes ultrasonic ranging and doppler devices, and/or an impedance plethysmograph.

3,674,019
DUAL LAYER CELLULAR INFLATABLE PAD
Benton H. Grant, Stamford, Conn., assignor to Grant Airmass Corporation, Stamford, Conn.
Filed Oct. 23, 1970, Ser. No. 83,269
Int. Cl. A61h 1/00
U.S. Cl. 128—33 **9 Claims**



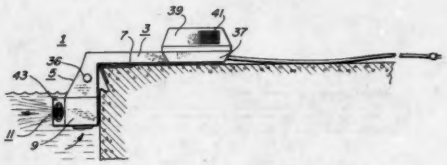
A dual layer cellular inflatable pad having the cells of each interfitting with the cells of the adjacent layer. The cells of one

layer may be alternately inflated and deflated. The layers have a manifold across and adjacent the longitudinal cell ends with a small continuation of the cells on the end sealed side of the manifold to prevent arching or curling of the pad.

3,674,020
POOL HYDROMASSAGE ASSEMBLY

Roy A. Jacuzzi, Moraga, Calif., assignor to Jacuzzi Research, Inc.

Filed May 10, 1971, Ser. No. 141,836
Int. Cl. A61h 9/00
U.S. Cl. 128—66 **8 Claims**

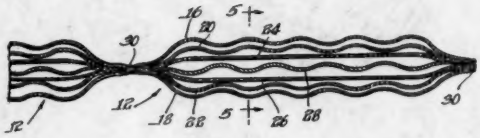


A hydromassage assembly for placement at pool side, and involves a housing including a horizontal section for placement on the deck of the pool and an angularly disposed or substantially vertical section of a length sufficient that its free end may be submerged in the water of the pool. A motor driven pump at the free end of the horizontal section is adapted to hydraulically drive a plurality of hydro-air jet head assemblies installed in the submersible end of the angularly disposed section, each of the hydro-air jet head assemblies being adapted to draw air through an air intake tube extending through a wall of the housing above the water level of the pool. The installation of a plurality of hydro-air jet head assemblies provides for substantially uniform hydro-air jet activity throughout a wide arc.

3,674,021
PLASTIC BANDAGE OR SPLINT

Harold I. Snyder, R.R. #3, P.O. Box 489, Dover, Ohio, and Richard R. Trexler, 9509 Lawndale Ave., Evanston, Ill.

Filed Dec. 28, 1970, Ser. No. 101,493
Int. Cl. A61f 5/04
U.S. Cl. 128—90 **10 Claims**

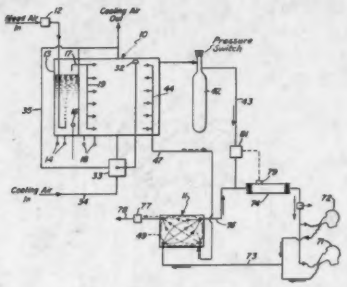


The disclosed structure comprises an elongated bandage of the wrap-around type. The bandage is composed of a plurality of superposed strips of cloth or the like, one of which carries plastic resin and another of which carries a hardener or catalyst. A barrier sheet is interposed between the strips to keep the resin and hardener separated, the barrier sheet being arranged to provide a multiplicity of openings over its surface upon manipulation of the package, whereby to bring the resin and hardener into contact uniformly over the surface of the bandage. Upon application of the bandage to a body part of the like, and upon setting of the resin, a rigid plastic bandage or splint is provided.

3,674,022
INTEGRATED SYSTEM FOR GENERATING OXYGEN AND CONTROLLING CARBON DIOXIDE CONCENTRATION IN CLOSED CIRCUIT BREATHING APPARATUS

Angelo Dounoucos, Schenectady, N.Y., assignor to General Electric Company

Filed Aug. 31, 1967, Ser. No. 664,875
Int. Cl. A62b 7/02
U.S. Cl. 128—142 **8 Claims**

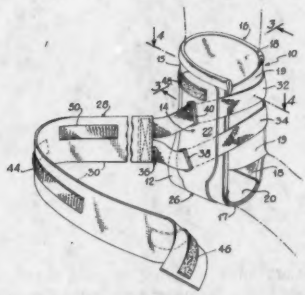


A particularly effective permselective membrane gas separation device employing an immobilized liquid film, which must be retained in damp condition, is coupled with a solid polymer electrolyte fuel cell apparatus to which electrical energy and moist air are supplied. The fuel cell preferentially transports essentially pure oxygen across the solid electrolyte for ultimate, or immediate, use in a closed circuit breathing system as the make-up oxygen gas for purified exhaled air, which has been circulated over one side of the permselective liquid membrane area of the gas separation device. Moist gaseous exhaust of controlled relative humidity from the cell is used to "scrub" and dampen the opposite side of this same permselective liquid membrane area optimizing the performance and, in the case of un-encased liquid membranes, extending the useful life thereof and thereby eliminating the need for a separate humidifying device.

3,674,023
ANKLE SUPPORT PROVIDING HIGH BRACING STRENGTH

Robert C. Mann, c/o Merikyle Co., Inc., 258 Irving St., Framingham, Mass.

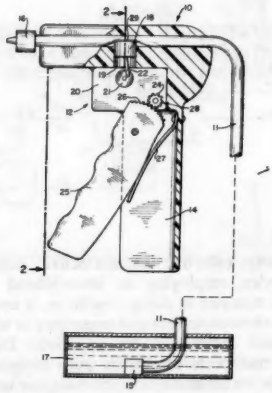
Filed July 2, 1969, Ser. No. 838,481
Int. Cl. A61f 13/06
U.S. Cl. 128—166 **20 Claims**



An ankle support has an open-fronted heel boot of relatively stiff construction to brace an ankle against sprains without

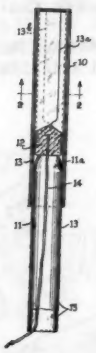
constricting the ankle. An elastic strap section spanning the wearer's instep and a nonelastic ankle-wrapping strap section hold the boot snugly on the wearer's foot without significantly restricting walking movements.

3,674,024
INCISION IRRIGATOR FOR USE DURING SURGICAL PROCEDURES
John Cirillo, Glen Ridge, N.J., assignor to Walter Kidde & Company, Inc., Belleville, N.J.
Filed July 15, 1970, Ser. No. 54,911
Int. Cl. A61m 1/00
U.S. Cl. 128—234 **7 Claims**



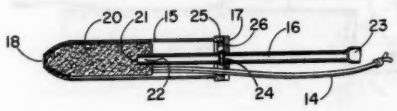
There is disclosed an incision irrigator which pumps a liquid by means of a deformable tube.

3,674,025
TAMPON ASSEMBLY
Keith T. Bleuer, 1663 Wilshire Drive, N.E., Rochester, Minn.
Filed April 14, 1970, Ser. No. 28,381
Int. Cl. A61l 15/10
U.S. Cl. 128—263 **10 Claims**



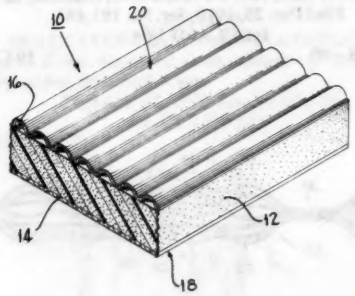
A tampon assembly including an outer tube and an inner tube telescoped into the outer tube, with a tampon body of elastomeric sponge material in the outer tube and expelled therefrom by means of the inner tube. A sheath of thin flexible low-friction material is disposed between the tampon body and the outer tube to facilitate the expulsion of the tampon body from the outer tube. The tampon body may be formed within a mold having inwardly extending spike-like projections on its inner surface to provide fluid passing openings on the exterior surface on the tampon body.

3,674,026
TAMPON INSERTION DEVICE
Edward E. Werner, and Edward G. Wollangk, both of Oshkosh, Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.
Filed Dec. 28, 1970, Ser. No. 101,913
Int. Cl. A61f 15/00
U.S. Cl. 128—263 **20 Claims**



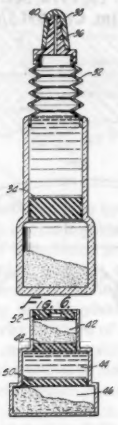
A tampon insertion device which comprises the combination of a tapered or round-nosed tampon having a detachable inserter rod seated in its base, and an outer protective tube having a tapered insertion-aiding forward end. The trailing end of the protective tube is closed off by a snap-in, pressure fit, or adhesively attached cap which functions as a closure, guide, and lock for the insertion rod.

3,674,027
DISPOSABLE WET COMPRESSES
Raul Fleischmajer, 121 Broome Lane, Merion, Pa.
Filed Aug. 6, 1969, Ser. No. 849,293
Int. Cl. A61f 7/10
U.S. Cl. 128—268 **7 Claims**



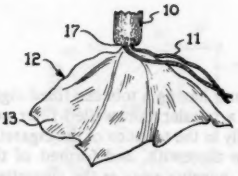
A disposable dermatological compress for the application of aqueous solutions to the skin to achieve evaporative cooling includes a body of water-permeable material constructed as a multi-layer device. An inner layer of smooth sheeting is directly applied to the skin. An intermediate layer of water-absorbing material functions as a reservoir to retain a large quantity of solution. An outer evaporation layer receives the solutions from the reservoir for evaporation. The evaporation layer has a surface area which is several times larger than the area defined by the outer boundaries of the unit to serve as an efficient evaporator.

3,674,028
MULTI-MIX
Robert W. Ogle, Newport Beach, Calif., assignor to IMS Limited
Filed June 4, 1969, Ser. No. 830,311
Int. Cl. A61j *01/00*; B65d *01/04*
U.S. Cl. 128—272 4 Claims



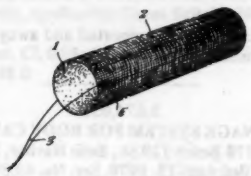
This patent describes a novel medicament container comprising a vial having an open end and a closed end, at least one slidable resilient stopper within said vial normally positioned intermediate said open end and said closed end and normally forming a fluid tight seal on the walls of said container, said stopper being slidable within said container away from said open end toward said closed end, said vial having a zone of a diameter larger than the largest lateral diameter of said stopper and into which said stopper is received as it is slid away from said open end to permit fluid communication from one side of said stopper to the other side of said stopper and thereby permit mixing of different materials positioned above and below said stopper, said container also having closure means at said open end to provide a multi-compartment medicament storage device.

3,674,029
CATAMENIAL TAMPON AND WRAPPER THEREFOR
John D. Bates, and Virginia A. Olson, both of Appleton, Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.
Filed March 26, 1968, Ser. No. 716,224
Int. Cl. A61f *13/20*
U.S. Cl. 128—285 10 Claims



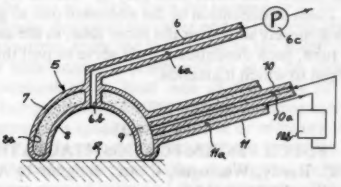
A compressed catamenial tampon designed for digital insertion. The tampon is centered on a protective wrapper which is gathered and folded around the tampon to completely enclose it. The gathered wrapper is closed near the top of the tampon with an easily removable closure means. A central portion of the wrapper is releasably fastened to the base of the tampon.

3,674,030
CATAMENIAL TAMPONS OR THE LIKE
David Thomas Jones; George Edward Jowett, both of Swansea, Glamorgan, Wales, and Edward Ernest Webster, Orpington, Kent, England, assignors to Sponcel Limited, Croydon, Surrey, England
Continuation of Ser. No. 744,551, July 12, 1968, abandoned. This application Dec. 11, 1970, Ser. No. 97,314
Claims priority, application Great Britain, July 19, 1967, 33,094/67
Int. Cl. A61f *13/20*
U.S. Cl. 128—285 5 Claims



A catamenial tampon comprising an elongated strip of regenerated cellulose sponge material bonded to an outer covering of reinforcing material and compressed and dried to a reduced diameter, said covering being adapted to permit expansion of said sponge material when moistened.

3,674,031
METHOD OF AND DEVICE FOR CRYOGENIC SURGERY
Hans-Joachim Weiche, Hannover, Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Germany
Filed March 25, 1970, Ser. No. 23,165
Claims priority, application Germany, March 29, 1969, P 19 16 343.0
Int. Cl. A61b *17/36*; A61m *1/00*; F25d *3/00*
U.S. Cl. 128—303.1 6 Claims

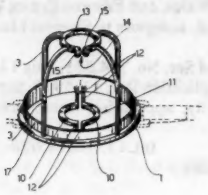


A system for performing cryogenic surgery, especially the removal or treatment of mammalian tissue such as tonsil tissue, wherein the tissue is drawn by suction into the cavity of an instrument the walls of which are chilled, e.g., by liquid nitrogen.

3,674,032
DEVICE FOR ANCHORING NEW-BORN BABIES UMBILICAL CORDS UNTIL ATROPHY THEREOF
Ernesto Minganti, 12, Via Roncati, 40134 Bologna, Italy
Filed April 17, 1970, Ser. No. 29,396
Claims priority, application Italy, April 17, 1969, 1606 A/69; Feb. 17, 1970, 3334 A/70
Int. Cl. A61b *17/08*; A61f *13/00*
U.S. Cl. 128—346 2 Claims

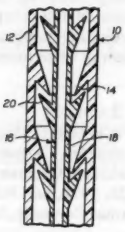
A device for anchoring the umbilical cords of new-born babies comprises a base ring supportable on a baby's body about the umbilical cord and an upper ring fixed out of the plane of

the base ring and able to support the lower part of the umbilical cord substantially normal to the body. The upper part of



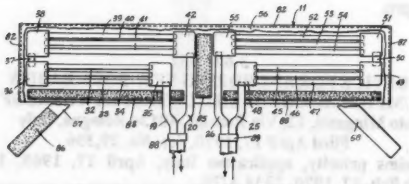
the umbilical cord can be supported and away from the body on a cage-like member.

3,674,033
DRAINAGE SYSTEM FOR BODY CAVITIES
John Powers, 178 Beach 129 St., Belle Harbor, N.Y.
Filed Aug. 13, 1970, Ser. No. 63,399
Int. Cl. A61m *27/00*
U.S. Cl. 128—350 R **4 Claims**



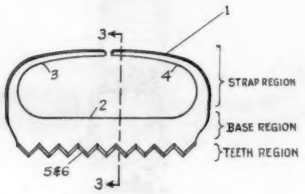
The invention comprises an inner and outer tube provided on their facing surfaces with canted projections which, in ratchet-like fashion, permit movement in one direction but not the other. The outer tube may be sutured to the skin and, in the event of distention of the abdomen due to gas, the outer tube will merely slide over the inner tube; in the absence of the outer tube, such distention would serve to pull the tube out of the organ to which it extends.

3,674,034
POUCH SYSTEM FOR HOSPITAL PATIENTS
John C. Hardy, Weatogue, Conn., assignor to Angelica Corporation, St. Louis, Mo.
Filed Feb. 8, 1971, Ser. No. 113,132
Int. Cl. A61f *7/00*
U.S. Cl. 128—379 **10 Claims**



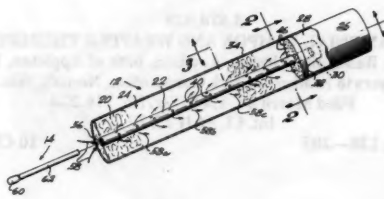
Heat-controlled exchange pouches for strapping to strategic areas of a patient's body where the main blood arteries are close to the skin surface. Each pouch is a flat, flexible tubing array within a removable bag, conformable to the body area which the pouch contacts. Separate fluid supply and return tubes for the pouches at each side of the body provide independent temperature control.

3,674,035
THRESHING IMPLEMENTS
Dorothy Byars Edmiston, P.O. Box 855, Santa Monica, Calif.
Filed Oct. 13, 1970, Ser. No. 80,292
Int. Cl. A01f *5/00*
U.S. Cl. 130—10 **1 Claim**



A hand-held corn-sheller, by which an unskilled operator can shell the kernals off a husked ear of corn (maize), in the dried, fresh, or cooked condition. A single piece of sheet metal is formed so that it fits around the palm and back of the user's hand and also presents two rows of teeth extending out from the palm. Rotating the ear against the teeth causes them to inter-act in a manner which shells the corn.

3,674,036
CIGARETTE SMOKING MEANS
Fidel Vega, 4787 S. W. 5 Terrace, Miami, Fla.
Filed July 13, 1970, Ser. No. 54,355
Int. Cl. A24d *01/04, 01/08*
U.S. Cl. 131—7 **4 Claims**

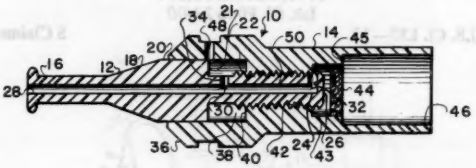


A cigarette unit having a tobacco filled cigarette body portion including a tubular thin walled filter core portion embedded coaxially in the tobacco of the cigarette body, extending coextensive therewith, and formed of thin combustible paper material, burning away as the cigarette is smoked. The cigarette unit has a filter tip portion including a filter mass and a trap socket recess to catch liquid condensate and impurities of combustion of a burning cigarette. The invention preferably further includes a match detachably fitted in the forward interior of the tubular filter core of the cigarette body and a striking surface formed on the exterior surface of a cigarette package for igniting a match in lighting a cigarette.

3,674,037
SMOKING HABIT-BREAKING AID APPARATUS

William S. Fortune, 14250 Dearborn St., Panorama City, Calif.

Filed Nov. 9, 1970, Ser. No. 87,996
Int. Cl. A24f 05/04
U.S. Cl. 131—198 A 2 Claims



A cigarette holder or tobacco pipe having a transverse bore in the stem portion that is in communication with atmosphere. A port-type valve system is included in the stem portion and includes a pair of threaded portions connecting axially arranged members, the members having transverse or radial bores therein and having annular chambers communicating with selected bores whereby rotation of said members relative to each other will move one axially with respect to the other and place portions of said transverse bores in communication with said chambers whereby smoke passing through the device may be mixed with air in a ratio between zero and a maximum. The bores etc., are sized so that the effective draw may not be altered upon a change in said ratio. The valve system is connected with ducts leading thereto from the tobacco holding portion and from the mouthpiece end of the device.

3,674,038
TREATMENT OF HUMAN HAIR WITH ZINC AND CADMIUM DITHIOLATE DERIVATIVES

Pierre Bore, Montfermeil, France, assignor to Societe Anonyme dite L'Oreal

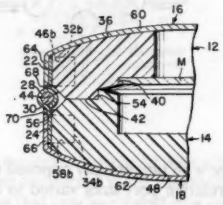
Filed Feb. 19, 1969, Ser. No. 800,721
Claims priority, application Luxembourg, Feb. 20, 1968, 55,515
Int. Cl. A61k 7/06, 7/10; A45d 7/04
U.S. Cl. 132—7 9 Claims

Compositions for setting hair containing a bivalent metal dithiolate derivative having at least one N-methylol group and the process of treating human hair with these compositions.

3,674,039
COSMETIC CONTAINER

Alphonso N. Vastano, East Brunswick, N.J., assignor to Volupte, Inc., Elizabeth, N.J.

Filed Sept. 21, 1970, Ser. No. 74,035
Int. Cl. A45d 33/00
U.S. Cl. 132—82 8 Claims



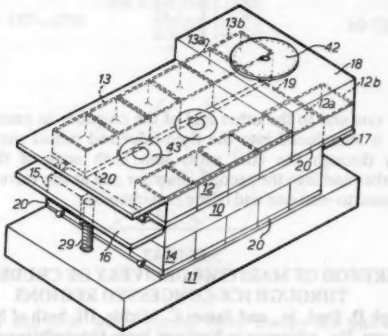
In a small container, such as a cosmetic compact or the like, a hinge is loosely coupled to top and bottom insert members without the use of fasteners or the like. Top and bottom cover plates serve to capture the hinge and prevent its inadvertent removal. In one embodiment, finger means formed integrally with the hinge are received in appropriate slots or recesses formed in the top and bottom insert members.

The aforementioned abstract is neither intended to define the invention of the application which of course, is measured by the claims, nor is it intended to be limiting as to the scope of the invention in any way.

3,674,040
SEQUENTIAL PROCESSING APPARATUS

Francis Thomas Howells, Tarporley, and Anthony Grenfell Ashe, Runcorn, both of England, assignors to Shandon-Elliott Limited, Runcorn Cheshire, England

Filed March 9, 1971, Ser. No. 122,335
Claims priority, application Great Britain, March 17, 1970, 12,666/70
Int. Cl. B05c 3/04, 3/09; B08b 3/04
U.S. Cl. 134—58 R 11 Claims



A sequential processing apparatus, particularly for use in pathology especially histology, comprises support means for supporting at least one row of baths above another row and mechanism for stepping said rows of baths in opposite directions. A transfer device at one end of the rows of baths transfers baths, one at a time, from the upper row to the lower row and a transfer device at the other end of the rows transfers baths, one at a time, from the lower row to the upper row. A specimen or slide carrier is positioned so as to be above the path of movement of at least one of the rows of baths, mechanism being provided for lowering and raising said carrier so as to immerse a specimen or slide in or withdraw it from a bath. In one preferred embodiment of the invention there are two side-by-side groups of baths, each group comprising upper and lower rows of baths and the specimen or slide carrier is moved periodically across the apparatus from a position over a row of baths of one group to a position over a row of baths of the other group.

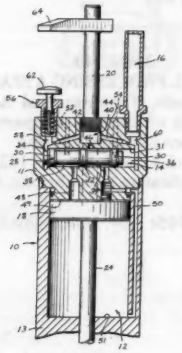
3,674,041
PRESSURE RESPONSIVE ACTUATOR HAVING APPLICATION TO A VALVE SPOOL OR LIKE DEVICE

Robert N. Beals, 500 E. Adams St., Plymouth, Ind.

Filed May 7, 1970, Ser. No. 35,308
Int. Cl. F16k 11/02
U.S. Cl. 137—1 3 Claims

A pressure responsive actuator having application to a valve spool or similar reciprocable member. The actuator includes a housing having a first chamber therein. A reciprocable member is positioned within the chamber and is shiftable from one end to the other end of the chamber. A fluid inlet is provided in the housing and has one inlet port in communication with one end of the chamber and another inlet port in communication with the other end of the chamber. A valve, which is

normally closed, communicates with one end of the chamber for venting that end of the chamber when the valve is actuated. The housing defines a second chamber which is in communication with the first chamber at the opposite end of the chamber from the valve. The reciprocable member is shifted



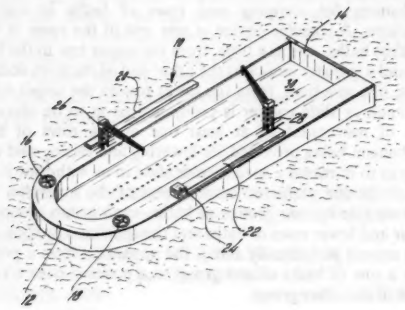
from one end to the other end of the chamber as pressurized fluid is introduced into the fluid inlet and passes simultaneously through the inlet ports into both ends of the first chamber and into the second chamber and as the valve is then actuated to vent one end of the first chamber.

3,674,042

METHOD OF MARITIME DELIVERY OF CRUDE OIL THROUGH ICE-CONGESTED REGIONS

Joseph D. Deal, Jr., and James C. Michie, III, both of Newport News, Va., assignors to Newport News Shipbuilding and Dry Dock Company, Newport News, Va.

Filed April 13, 1971, Ser. No. 133,578
Int. Cl. B63b *27/00*
U.S. Cl. 137—1 **17 Claims**



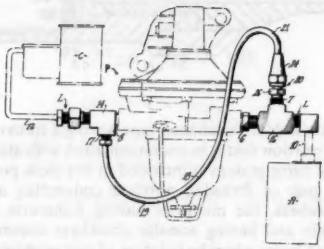
Method of maritime delivery of crude oil through ice-congested regions, for example, from the North Slope of Alaska through the Northwest Passage, including driving an icebreaker vessel with crude oil load through the ice-congested region, pumping crude oil from said icebreaker vessel into a floating oil storage terminal maintained at the far edge of the ice-congested region, offloading crude oil from within the storage terminal into a tanker, and driving the tanker to an ice-free oil terminal facility. A modification of invention includes loading of the crude oil at the North Slope into a submarine vessel which is driven beneath the ice pack to the floating oil storage terminal at the far edge of the ice pack.

3,674,043

METHOD OF PREVENTING VAPOR LOCK DURING ENGINE OPERATION AND OF FUEL LEAKAGE TO CARBURETOR AFTER ENGINE STOPPAGE

Neil C. Norton, P. O. Box 104, Gardena, Calif.

Continuation-in-part of Ser. No. 726,308, May 3, 1968, Pat. No. 3,559,680, which is a continuation-in-part of Ser. No. 616,594, Feb. 16, 1967, abandoned. This application June 26, 1970, Ser. No. 50,074
Int. Cl. F04b *23/00*
U.S. Cl. 137—12 **5 Claims**



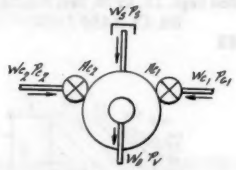
Vapor lock which might otherwise occur in its fuel supply pump during high temperature operation of a liquid-fuel engine, is minimized or eliminated by continuously withdrawing a small fraction of the flow liquid from the bottom level of the pump outlet conduit and reintroducing it at the top level of the pump inlet conduit. Also, after pump and engine stoppage, pressurized liquid remaining in the pump to carburetor (outlet) conduit, is prevented from dribbling into the carburetor and vaporizing into adjacent space (and creating a fire hazard and air pollution) by relieving the back-pressure in such conduit and then closing same without breaking the liquid column, by valve means in the (sigmoid) pump bypass. Such small capacity bypass may be left open during pump and engine function, without interfering with normal operation, and closes in response to decreased back-pressure in the line when the pump stops.

3,674,044

OPPOSING CONTROL VORTEX VALVE

Endre A. Mayer, Birmingham, Mich., assignor to The Bendix Corporation

Filed Jan. 8, 1970, Ser. No. 1,504
Int. Cl. F15c *1/16*
U.S. Cl. 137—81.5 **5 Claims**



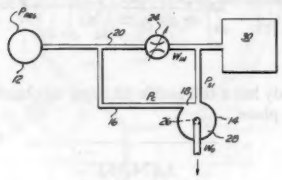
A vortex valve with tangentially opposed control and supply ports with the relative port sizes varied to control the output characteristics and produce a high or tailored gain at a desired pressure value and/or to introduce a pronounced negative resistance in an operating range of the valve. The valve is also combined with a fluid operated pressure regulating circuit, in which it is used as a flow controller.

3,674,045

VORTEX VALVE FLUID OSCILLATOR

William V. Millman, Moline, Ill., and Endre A. Mayer, Birmingham, Mich., assignors to The Bendix Corporation

Filed July 14, 1970, Ser. No. 54,708
Int. Cl. F15c *1/16*
U.S. Cl. 137—81.5 8 Claims



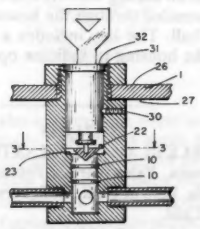
A vortex valve for use in a fluid oscillator circuit characterized by exhibiting a pronounced negative resistance characteristic in a portion of its operating range and by having a vortex chamber defined in part by a resiliently movable portion to provide a mechanical output in response to pressure variations in the chamber. This particular vortex valve is incorporated into a fluid oscillator arrangement to produce oscillatory pulses in the vortex chamber and responsive movements of the movable portion by adjusting the control and supply pressures and flows so as to be in the negative resistance range of the vortex valve while at the same time maintaining a constant supply flow.

3,674,046

VEHICULAR LOCKING DEVICE

James V. Miceli, 44 Bay 40th St., Brooklyn, N.Y.

Filed July 30, 1970, Ser. No. 59,378
Int. Cl. F16k *35/06*
U.S. Cl. 137—384.2 6 Claims



A vehicular locking device provided with a housing having inlet and outlet ports connected in the fuel feed line of a vehicle, includes a valve that can be rotated into open and closed positions for passing and blocking the fuel flow selectively. A lock is provided in the housing in operative association with the valve so that the valve may be locked as necessary by an authorized operator having a key therefor.

3,674,047

THROTTLE DIVIDER OF FLUID MEDIUM FLOW

Mikhail Borisovich Tauger, ulitsa Baumana, 27, kv. 20, Sverdlovsk, U.S.S.R.

Filed Sept. 4, 1970, Ser. No. 69,609
Int. Cl. G05d *11/03*
U.S. Cl. 137—101 2 Claims

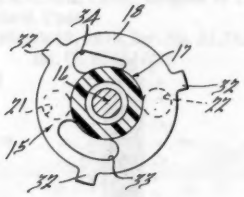
A throttle flow divider having a floating slide valve in a body whose outlet channels are interconnected by means of a permanent hydraulic resistor which assists in increasing the accuracy of the flow division due to redistribution of the fluid medium from one working branch with a higher pressure to the other working branch with a lower pressure.

3,674,048

MIXING VALVE

Alex Manoogian, Grosse Pointe Farms, and Eric V. Pullen, Northville, both of Mich., assignors to Masco Corporation, Taylor, Mich.

Filed April 9, 1970, Ser. No. 132,703
Int. Cl. F16k *11/08*
U.S. Cl. 137—270 10 Claims



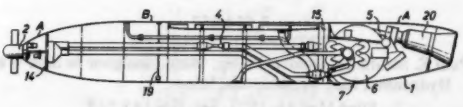
A hot and cold water mixing valve having hot and cold water inlet ports controlled by a rotatable valve member to open and close the inlet ports in sequence suitable for use of the valve as a shower valve or the like. An adjustable stop associated with the valve permits the full hot position to be adjusted to prevent scalding. In installations such as apartments, hotels or the like wherein a single system of hot and cold water supply pipes services shower or tub facilities arranged back to back on opposite sides of a common wall containing the supply pipes, a fixed bushing part may be selectively oriented relative to the inlet ports so that in both such installations the valve is rotatable in the same direction of rotation and provides the proper sequence of operation without the necessity of additional cross over piping within the wall.

3,674,049

AIR-TO-AIR REFUELLING HOSE REELS

Peter Stevens Macgregor, Dorset, England, assignor to Flight Refuelling Limited, London, England

Filed Sept. 18, 1970, Ser. No. 73,445
Int. Cl. B65h *75/34*, *75/30*
U.S. Cl. 137—355.2 8 Claims



An air-to-air refuelling system and hose reel mechanism therefor in which a constant tension spring motor is coupled to the hose reel to achieve substantially constant tension in the hose during reeling in or reeling out of the hose. Arresting means comprising a ratchet and pawl mechanism is associated with the hose reel and is actuatable in response to operation of

the spring motor to provide a full trail stop facility for the hose. A feature of the invention is that a fixed displacement fuel pump (a fueldraulic motor) is coupled to a main fuel pump of the refuelling system via a hose reel control valve and is coupled to the hose reel via gearing and a sprag clutch such that the displacement pump rotates only when the hose reel is reeling out in order to effect speed limitation during reeling out. The fixed displacement pump when acting as a pump only rotates when the hose reel is reeling out but operates as a motor during rewinding of the hose reel utilizing the main fuel supply to provide rewind power.

3,674,050

CHECK VALVE FOR DRAINAGE OF FLUID INTO THE VASCULAR SYSTEM OR INTO A BODY CAVITY FOR THE TREATMENT OF HYDROCEPHALUS INTERNUS AND EXTERNUS

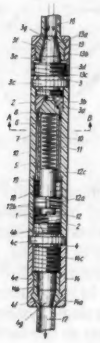
Francois Kuffer, Holligenstrasse 33, 3000 Bern, and Dietrich Strub, Schanzlistr. 38, 4500 Solothurn, both of Switzerland

Filed May 4, 1970, Ser. No. 34,389

Claims priority, application Switzerland, July 15, 1969, 10714/69

Int. Cl. A61m *27/00*

U.S. Cl. 137—536 **3 Claims**



The check valve for drainage of fluid into the vascular system or into a body cavity for the treatment of hydrocephalus internus and externus is fabricated of synthetic material and has a body with screw thread on each side. On the proximal side of the valve is screwed a connector, which has a cone and a cylindrical part to receive a proximal catheter, in addition to a screw thread for the fixing of a screw cap. On the connector is a shoulder serving as a stop for the screw cap and preventing shearing of the proximal catheter. The connector has a longitudinal bore which drains the fluid into the catheter, the bore widens to a cone and this cone is obturated by a piston, which possesses four longitudinal slots. A spring lays in the bore and can be adjusted by a regulating screw for the purpose of pressure calibration of the fluid.

3,674,051

HYDRAULIC COUPLER

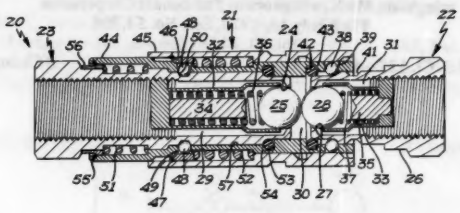
Paul E. Stratman, Golden Valley, Minn., assignor to Safe Way Hydraulics, Inc., Minneapolis, Minn.

Filed May 14, 1971, Ser. No. 143,323

Int. Cl. F16l *29/00, 37/28*

U.S. Cl. 137—614.04 **12 Claims**

A conduit terminating in a female body at one end and a source of hydraulic power at the other, and a conduit terminating in a male tip at one end and an hydraulically actuated mechanism at the other, are connected together by inserting the tip into the body with hydraulic pressure existent in both conduits, in one or the other conduit, or in neither conduit. The body has a releasable latching mechanism for securing the tip in place.



3,674,052

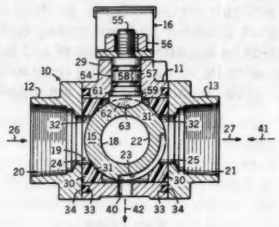
BALL VALVE

Leonard Hartman, Maplewood, and Joseph Sciuto, Jr., Crestwood, both of Mo., assignors to Stile-Craft Manufacturers, Inc., St. Louis, Mo.

Filed Jan. 12, 1970, Ser. No. 2,099

Int. Cl. F16k *11/02*

U.S. Cl. 137—625.21 **1 Claim**



The valve includes a housing having aligned inlet and outlet ports intercommunicating by means of a central conduit passing through a rotatable ball mounted in the housing. The central conduit permits fluid flow through the valve when the valve is in the open position. When the ball is rotated to a closed position a second conduit, provided on the surface of the rotatable ball, communicates between the outlet port and an exit orifice in the interior of the housing. The second conduit permits bleeding of the downstream hydraulic system. The ball is seated on sealing washers and rotated by means of a key which is journaled through the housing and into engagement with the ball. The key includes a handle cooperating with stops on the housing to indicate open and closed valve positions.

3,674,053

REPLACEABLE BLADDER PULSATION DAMPENER

Fernando Murman, Palos Verdes Peninsula, and George E. Lewis, Arcadia, both of Calif., assignors to Hydril Company, Los Angeles, Calif.

Filed June 12, 1970, Ser. No. 45,647

Int. Cl. F16l *55/04*

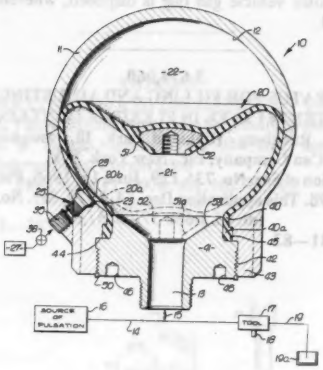
U.S. Cl. 138—30 **11 Claims**

A pulsation dampener comprises

a. a vessel having a hollow interior and a main inlet for first fluid subjected to pulsation,

b. a bladder extending within the vessel interior dividing same into a first zone adapted to receive said first fluid and a second zone adapted to contain second fluid under pressure, and

c. the vessel having an inlet for said second fluid and which is located to be overlapped by said bladder for sealing off

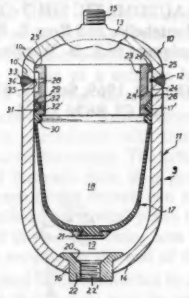


communication between said inlet and said second zone in response to first fluid pressure exertion against the bladder.

3,674,054
PRESSURE VESSEL

Jacques H. Mercier, 49 rue de Naples, Paris, France

Filed Feb. 16, 1971, Ser. No. 115,254
Claims priority, application France, March 6, 1970, 7008076
Int. Cl. F16l *55/04*
U.S. Cl. 138—30 **10 Claims**



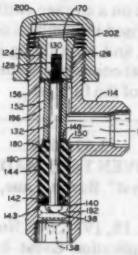
The invention relates to a pressure vessel or container comprising two substantially cup-shaped shells having their free edges located in juxtaposition by means of an internal annular retainer member which properly spaces such free edges to permit connection thereof by a weld and which also serves as the support for a deformable partition positioned in the container.

3,674,055
SEALING CONSTRUCTION FOR GAS MAINS AND THE LIKE

Charles W. Ray, 525 Stadium Drive, Fort Wayne, Ind.

Filed Dec. 28, 1970, Ser. No. 101,555
Int. Cl. F16l *55/10*
U.S. Cl. 138—89 **8 Claims**

An improved plug for gas mains which consists of two resilient members carried by a threaded stem. A nut rotates on the end of the stem and draws the two resilient portions

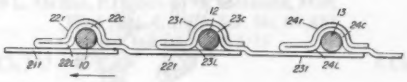


together, thus expanding them to make a sealing fit within an opening of the gas main.

3,674,056
SCUFF STRIP FOR TOW-ELEMENT HELICALLY WOUND TUBING

Paul J. D'Aprile, Forestville, Conn., assignor to The Wiremold Company, Hartford, Conn.

Filed March 20, 1970, Ser. No. 21,243
Int. Cl. F16l *11/16*
U.S. Cl. 138—134 **5 Claims**

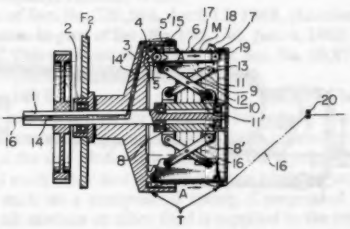


Two element collapsible tubing comprising a helical wire wound upon one edge of a helically wound, treated fabric or other kind of strip (of one or more plies thickness), the other edge of the strip overlying the adjacent or nearby convolution of the wire and being reversely folded upon itself, preferably outwardly, so that the wire is covered exteriorly with a double thickness of the flexible strip with the inner surface of the strip facing outwardly where it overlies the wire, thus providing a protective strip for the tubing over the wire. If the overlying folded edge overlies a wire convolution that is beyond the next adjacent convolution the tubing wall will be of multi-ply thickness, even when wound from a single ply flexible strip.

3,674,057
METHOD AND APPARATUS FOR PREPARING FILLING IN SHUTTLELESS LOOM

Shinichi Hosono, and Kazuyoshi Kida, both of Komatsu, Japan, assignors to Teijin Limited, Osaka, Japan

Filed Aug. 6, 1970, Ser. No. 61,746
Claims priority, application Japan, Aug. 9, 1969, 44/63209; Nov. 4, 1969, 44/88287
Int. Cl. D03d *47/36*
U.S. Cl. 139—122 R **9 Claims**



In a shuttleless loom, a length of at least more than one pick

of filling is pulled from a supply package located outside the shed continuously and at constant speeds and is partitioned into picks in a coil and advanced continuously toward filling-inserting means, the coil being caused to maintain a given pitch and accumulated on a storage swift. In multi-filling, such storage swifts are disposed in numbers equal to the number of fillings to be selected, and each filling is continuously pulled from supply packages at constant speeds compensating for the use and accumulation of the fillings.

3,674,058

LOOM AND WOVEN TAPE MADE THEREFROM

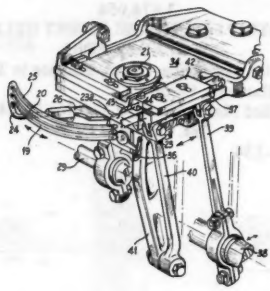
John Sellers, "Branclyst" Burgh Lane, Chorley, Lancashire, England

Filed Jan. 18, 1971, Ser. No. 107,401

Claims priority, application Great Britain, Jan. 20, 1970, 2,653/70

Int. Cl. D03d *47/00*; D03c *13/00*

U.S. Cl. 139—124 A **6 Claims**



A loom having weft insertion means in the form of three pivotally mounted arcuate members which lay loops of weft in a weft shed, and also having selvedge knitting means reciprocable alongside the warp shed. Two of the arcuate inserting members lay loops of weft in a split shed which is used for producing body tape and the third arcuate inserter is used for laying weft in a shed created for the production of pockets on the body tape. The two wefts laid in the body are brought together at an edge remote from insertion for the knitting therethrough of a catch thread to form a knitting selvedge, while the pocket weft loops are themselves knitting together to form interdigitated loops with or without a catch thread.

3,674,059

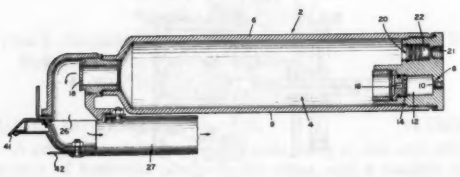
METHOD AND APPARATUS FOR FILLING VEHICLE GAS BAGS

Robert L. Stephenson, Sterling Heights, Mich., assignor to Allied Chemical Corporation, New York, N.Y.

Filed Oct. 19, 1970, Ser. No. 81,947

Int. Cl. B65b *1/04*, *3/04*

U.S. Cl. 141—4 **13 Claims**



A method and apparatus for filling motor vehicle gas bags. A gas-filled cylinder is provided with an inlet pressure sensitive rupture disc and a dislodgeable outlet plug. The inlet disc is in communication with a combustible material. The material is fired, yielding a gaseous product. The outlet plug is dislodged before, concurrently or subsequent to the rupture of the inlet disc. The liberated gas flows to a diffuser, about which a motor vehicle gas bag is disposed, whereby the gas bag is filled.

3,674,060

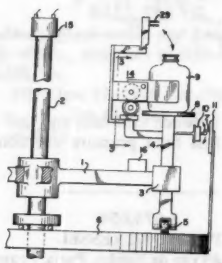
APPARATUS FOR FILLING AND ADJUSTING THE CONTENTS LEVEL IN FLEXIBLE CONTAINERS

Herbert S. Ruekberg, Highland Park, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Division of Ser. No. 736,139, June 11, 1968, Pat. No. 3,577,698. This application Dec. 14, 1970, Ser. No. 97,863

Int. Cl. B65b *57/00*, *61/00*

U.S. Cl. 141—83 **11 Claims**



An apparatus for filling a plastic bottle with a premeasured amount of liquid, squeezing the plastic bottle until the level of liquid in the bottle comes to a predetermined height and then capping and sealing the bottle.

3,674,061

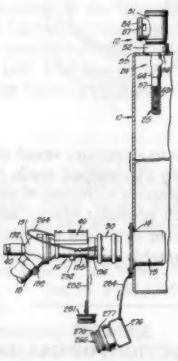
LIQUID TRANSFER APPARATUS WITH PRESSURE-SENSITIVE AUTOMATIC SHUT-OFF NOZZLE

Jay V. Calisher, Montebello, and Ross E. Burbick, Bellflower, both of Calif., assignors to E. B. Wiggins Inc., Los Angeles, Calif.

Filed Oct. 29, 1969, Ser. No. 872,148

Int. Cl. B67d *5/372*

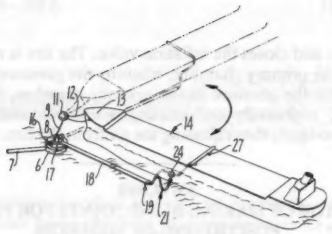
U.S. Cl. 141—198 **14 Claims**



A vented tank has a receptacle fitting at its fill port that mates with a nozzle on the end of a supply hose. Both the receptacle fitting and the nozzle have normally closed valves which open in response to mating of the two parts. The nozzle fitting is equipped with a normally closed snap acting valve

which is cocked open during the filling operation and snaps closed in response to abrupt rise in back pressure. During the filling operation a tank vent is open but closes in response to rise in the liquid level and thereby creates the back pressure. The tank vent also closes automatically if the tank is turned over.

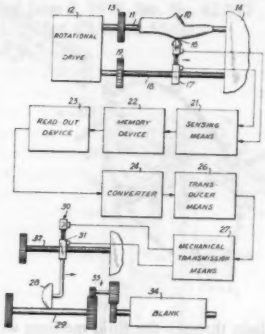
3,674,062
OFFSHORE LOADING AND UNLOADING OF TANKERS
Frederick S. Ellers, Menlo Park; Sam W. Small, Walnut Creek, and Luis B. Serpas, Belmont, all of Calif., assignors to Bechtel International Corporation
Filed Sept. 11, 1970, Ser. No. 71,588
Int. Cl. B65b *1/04, 3/04*
U.S. Cl. 141—387 **6 Claims**



The present invention provides an improved ship mooring device for ships and other vessels whereby fluids may be loaded or unloaded while the ship is moored offshore. In accordance with this invention, a monolithic anchor structure is secured to the sea bottom at a suitable location. Mounted upon the anchor is a swivel structure which is movable through 360°. Attached to the swivel structure is a tubular swing arm which, in accordance with this invention, has a neutral or nearly neutral buoyancy. The arm, however, is held by drag weight and buoyant hose in a generally horizontal position and, by means of the swivel, can swing over the sea bottom in a substantially horizontal plane through 360°. Attached to the end of the tubular swing arm is a flexible hose, one end of which is secured to the end of the swing arm and the other end is adapted to be connected to a suitable connection on the vessel so that a fluid may be transferred through the hose, the tubular swing line, the swivel and a submarine line extending to a shore location. When not in use, the hose is supported by encasing buoys so that the hose assumes an S configuration in a vertical plane. A second buoy is attached to the free end of the hose so that it may be readily picked up by the vessel.

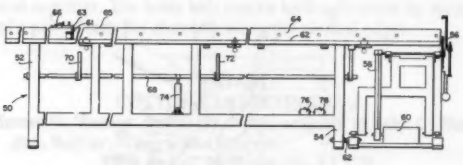
3,674,063
MEANS FOR MAKING SHOE LASTS
William G. Klingbeil, 8939 145th St., Jamaica, N.Y.
Filed Aug. 13, 1969, Ser. No. 849,832
Int. Cl. B23b *3/28*
U.S. Cl. 142—1 **1 Claim**

Apparatus for making shoe lasts. Electrical control signals which are proportional to the surface configuration of a shoe last model are derived and stored. Shoe last shaping machinery comprising a blank of suitable material and suitable



cutting surfaces are moved relative to each other responsive to the stored electrical control signals.

3,674,064
APPARATUS FOR CUTTING AND MARKING PLATE STOCK OF THE TYPE USED IN BUILDING WALL PANELS
James L. McRae, P.O. Box 4195, Meridian, Miss.
Filed Sept. 4, 1970, Ser. No. 69,631
Int. Cl. B27b *5/18*
U.S. Cl. 143—46 R **6 Claims**

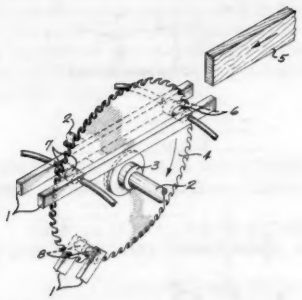


Apparatus for cutting and marking plate stock, such as the two by four type, used in building wall panels, particularly a longitudinally extending table for supporting the two by fours and a marking template in side by side relationship, and including a movable stop abutting the template and two by four at one end of the table and a circular saw pivotable across the stock for cutting the stock at the other end of the table.

3,674,065
SAW GUIDES
Louis R. Fairfield, Jr., Longview; Raymond A. Van Vliet, Mossyrock, both of Wash., and Thomas A. McLauchlan, Vancouver, British Columbia, Canada, assignors to Weyerhaeuser Company, Tacoma, Wash.
Continuation of Ser. No. 725,566, April 12, 1968, abandoned, Continuation-in-part of Ser. No. 695,740, Jan. 4, 1968, abandoned. This application July 6, 1970, Ser. No. 60,979
Int. Cl. B27b *5/28*
U.S. Cl. 143—160 R **20 Claims**

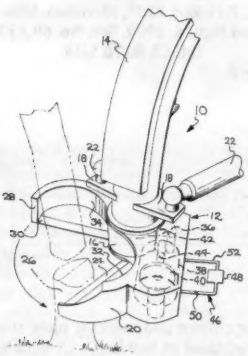
A method and apparatus for guiding a saw blade wherein the saw guides comprise opposed bearing shoes located on opposite sides of the saw blade, at least one of the bearing shoes urged toward each other and against the saw blade by an external force such as a compressed spring. Compressed air, water, water-air mixture or other fluid is supplied to the interior recesses of each of the bearing shoes and acts to form a

fluid bearing surface at the bearing shoe-saw blade interface. The external force exerted on the bearing shoes is transmitted



to the saw blade through the fluid medium with substantially no contact of the saw blade with the bearing shoes.

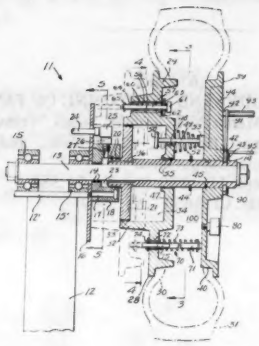
3,674,066
TREE SHEAR
Dean W. Shields, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio
Filed June 11, 1970, Ser. No. 45,313
Int. Cl. A01g *23/02*
U.S. Cl. 144—34 E **4 Claims**



A novel and improved tree shear adapted to sever a standing tree at ground level. The shear utilizes one stationary cutting blade and one movable cutting blade. The fixed cutting blade provides the reactionary force and cuts through one-half of the tree as the moving blade builds up force from its actuating cylinder to cut through the other half of the tree.

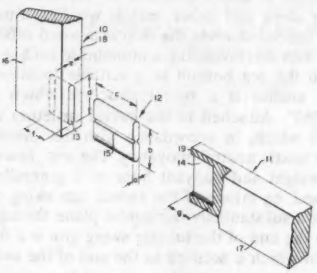
3,674,067
TIRE CHUCKING DEVICE
Donno W. Cooper, assignor to International Rubber Industries, Inc., Jeffersontown, Ky.,
Filed April 16, 1970, Ser. No. 29,043
Int. Cl. B29h *21/00;* **B60c** *25/00*
U.S. Cl. 144—288 A **12 Claims**

An air-operated tire chucking device consisting of a mandrel on which front and rear tire bead-engaging discs are slidably mounted. A removable stop key on the mandrel limits movement on the front disc. The rear disc has a cylinder which receives a stationary piston, defining an expansible primary chamber. With a tire between the discs, compressed air is admitted into this primary chamber, forcing the rear and front discs against the tire beads and thus forming a contact seal for inflation of the tire. As the rear disc reaches a predetermined position, a valve element carried thereby contacts the front disc and exposes a valve port in the rear disc, allowing air to exit from the primary chamber and fill the tire, the tire and discs now forming a secondary chamber. The tire continues to inflate until the air pressure in the tire forces the rear disc back and the valve element loses contact with the



front disc and closes the inflation valve. The tire is released by venting the primary chamber, whereby the pressure in the tire overcomes the pressure in the primary chamber, forcing the rear disc rearwardly and causing a tire vent valve carried thereby to open, thus releasing the air from the tire.

3,674,068
METHOD OF MAKING BLIND JOINTS FOR PRECISE POSITIONING OF MEMBERS
Donald E. Lucci, 152 Winter St., Aliquippa, Pa.
Division of Ser. No. 691,094, Nov. 24, 1967, abandoned. This application Dec. 16, 1969, Ser. No. 885,583
Int. Cl. B27f *1/08*
U.S. Cl. 144—309 L **4 Claims**

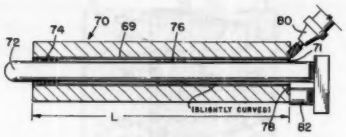


Oblong mortises having substantially parallel walls are cut into the confronting faces of elements to be joined. These mortises are precisely positioned relative to a particular face of the elements. A spline is then cut to conform to the dimensions of the cavity formed by the mortises and inserted therein in order to complete the joint.

3,674,069
METHOD OF MAKING A BOBBIN BARREL
John B. Hawley, 410 Progress Ave., High Point, N.C.
Division of Ser. No. 584,046, Sept. 19, 1966, abandoned. This application March 20, 1969, Ser. No. 814,881
Int. Cl. B27c *9/00;* **B65h** *75/14, 75/30*
U.S. Cl. 144—326 R **2 Claims**

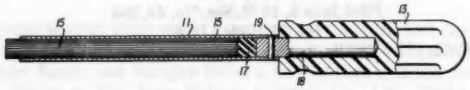
A flanged bobbin in which the barrel has a cylindrical exterior concentric with the rotational axis of the barrel and a flange concentrically mounted on the end of the bobbin to

which flange is secured concentrically a unitary drive lug engaging flange having a symmetrical butterfly recess and a



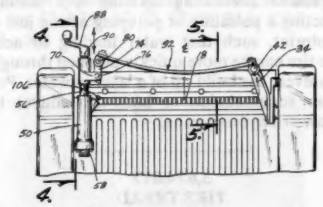
method of constructing a bobbin barrel with minimum eccentricity and vibration for operation at high rotational speeds.

3,674,070
UNIVERSAL SCREWDRIVER
Michael Mahoney, 4703 Marie St., Beltsville, Md.
Filed June 2, 1969, Ser. No. 829,290
Int. Cl. B25b *15/02*
U.S. Cl. 145—50 A **11 Claims**



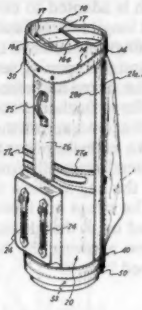
This disclosure describes a hand tool having the ability to engage various types and sizes of screw fastener heads. The hand tool comprises a bundle of wires held in a generally tubular housing with one end of the bundle projecting slightly beyond the end of the housing. The other end of the bundle presses against a deformable cell located in the housing. A handle is attached to the other end of the housing. When the projecting wires are pressed against the head of a screw fastener, the wires deform about the head thereby making a replica mold of the surface of the screw fastener head. Lateral torque thereafter applied to the handle causes the deformed wires to transmit this torque to the screw causing it to rotate.

3,674,071
FATTING ATTACHMENT FOR SKINNING MACHINES
Donald L. Beasley, Des Moines, Iowa, assignor to Townsend Engineering Company, Des Moines, Iowa
Filed July 20, 1970, Ser. No. 56,319
Int. Cl. A22c *17/12*
U.S. Cl. 146—130 **4 Claims**



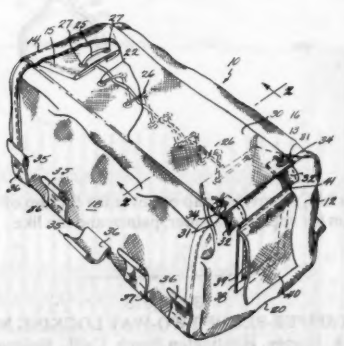
A fatting attachment for skinning machines comprising a curved fatting blade mounted above the skinning blade of the machine. Adjustment means is secured to one end of the fatting blade so that the fatting blade can be moved toward and away from the skinning blade to vary the depth of the fatting blade in the fat.

3,674,072
SECTIONAL GOLF BAG
Yoshitaka Shuto, Shichidojutakanai, 1-22, 3-cho, Kitahatagochonishi, Sakai, Osaka Prefecture, Japan
Filed June 2, 1970, Ser. No. 42,817
Int. Cl. A63b *55/00*
U.S. Cl. 150—1.5 R **6 Claims**



In a sectional golf bag which can be manually assembled without sewing machines, a top collar unit and a bottom unit with a respective tri-angular grooved cavity communicating integrally with a respective annular groove formed in and along each of the opposed peripheral walls of both units, and a body unit with an upper and lower flange means having a configuration corresponding to each of the triangular grooved cavities, respectively, such that they can be received forcibly into and engaged with each of the triangular grooved cavities for coupling the top collar unit, the bottom unit and the body unit together. The body unit can be held cylindrical by means of a pair of fastener elements along the vertical edges.

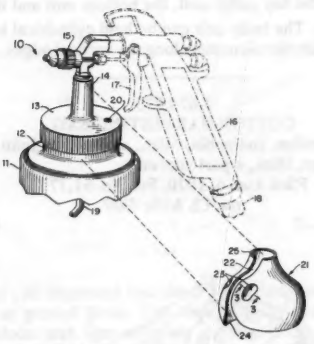
3,674,073
COTTON HARVESTING BAG
James D. Hendon, Indianola, Miss., assignor to John C. Hendon, Bolivar, Miss., a part interest
Filed Aug. 6, 1970, Ser. No. 61,779
Int. Cl. A45c *7/00*
U.S. Cl. 150—7 **4 Claims**



A bag construction is described which is adapted to receive harvested cotton or the like directly from the harvesting machinery in the field and to store same indefinitely until such time that the harvested material can be further processed. The bag is designed so that the sides and ends thereof have flaps capable of being extended upwardly therefrom, and these

flaps are adapted to be attached to a frame during the loading process. The operator of the harvesting machinery can simply drive up to the bag to unload the harvested cotton without the need for any special attachments or conveying mechanisms on the harvesting machinery. When the bag is filled, the top end of the side flaps are pulled together by lacing, and following this, the top portions of the sides, or where the flaps are attached to the sides, are laced together as well. The flap portions of the ends of the bag may then be laced together, and a flap member which is adapted to cover the entire top of the bag extends over it longitudinally and is tied down. The bag is provided with openings on each end thereof, which are loosely covered by a flap, and this opening serves as a means for circulating air through the stored harvested cotton or the like while it is awaiting transfer to further processing machinery. Straps are provided which extend across the width of the bottom of the bag and are sewn to the bag near the bottom portion of the bag side. Loops extend upwardly from the point at which the straps are sewn to the bag to allow the bag to be lifted in an upright position. The straps are loose from the bottom of the bag so that if picked up at that point the bag will be raised in an inverted position allowing the harvested material stored therein to be dumped from it.

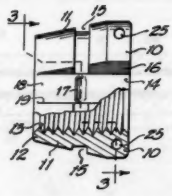
3,674,074
REMOVABLE COVER FOR SPRAY GUN
Walter J. Lavis, 138 W. 31st St., Bayonne, N.J.
Filed July 17, 1970, Ser. No. 55,778
Int. Cl. B65d *65/02*
U.S. Cl. 150—52 R **1 Claim**



A flexible, removable cap or cover for the top of a pressure spray gun for applying lacquer, paints, and the like.

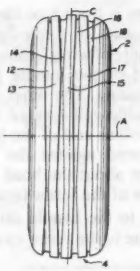
3,674,075
TAMPER-PROOF TWO-WAY LOCKING NUT
Robert A. Hoegee, Huntington Beach, Calif., assignor to Shur-Lok Corporation, Santa Ana, Calif.
Filed Nov. 14, 1969, Ser. No. 876,760
Int. Cl. F16b *23/00, 29/00, 37/00, 39/284*
U.S. Cl. 151—21 B **5 Claims**

An all-metal conical nut having coined locking depressions at the intersections of a pair of external wrenching grooves parallel to the nut axis and an annular groove midway between the ends of the nut, which can be threaded onto the end of a threaded rod end either base-first or tip-first, the latter



facilitating its application to a control rod end bearing before insertion of the latter into a control rod.

3,674,076
PNEUMATIC TIRE TREAD DESIGN
Charles R. Dailey, Jr., Cuyahoga Falls, Ohio, assignor to The General Tire & Rubber Company
Filed June 8, 1970, Ser. No. 44,294
Int. Cl. B60c *11/06*
U.S. Cl. 152—209 R **8 Claims**

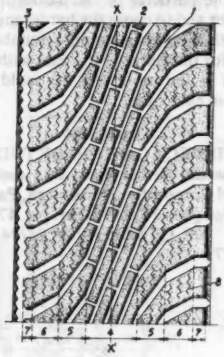


A pneumatic tire tread is provided with a groove or series of grooves of continuously variable width around the circumference of the tire. The groove or grooves may be used in combination with rib elements which are uniform or variable in width. The respective pitches of the grooves are offset or different, such that the forward portion of the tread footprint area will present alternating opening and closing voids, thereby effecting a pulsating or pumping action just ahead of the tire footprint, such that water tending to accumulate ahead of the tire can be more quickly pumped through toward the rear to prevent the build-up of a layer of water. Prevention of this water accumulation or build-up reduces the tire's inclination toward hydroplaning.

3,674,077
TIRE TREAD
Henri Verdier, Beauregard-L'Eveque, France, assignor to Compagnie General Des Etablissements Michelin raison sociale Michelin & Cie, Clermont-Ferrand, Puy-de-Dome, France
Filed July 20, 1970, Ser. No. 56,346
Claims priority, application France, July 21, 1969, 6924850
Int. Cl. B60c *1/08*
U.S. Cl. 152—209 **9 Claims**

The tread of a pneumatic tire is formed with symmetrical

grooves, preferably S-shaped, extending from one edge of the tread to the other. The grooves are generally longitudinal in



the central portion of the tread and generally transverse near the edges of the tread.

3,674,078

PNEUMATIC TIRE WITH POLYESTER CASING, NYLON BREAKER AND STEREO REGULAR POLYBUTADIENE

Shiro Sasaki, and Narajiro Shibata, both of Osaka, Japan, assignors to The Toyo Rubber Industry Co., Ltd., Osaka, Japan

Filed Dec. 2, 1968, Ser. No. 780,586
Claims priority, application Japan, Dec. 1, 1967, 42/77228
Int. Cl. B60c *1/00*; C08d *9/16*
U.S. Cl. 152—330 **7 Claims**

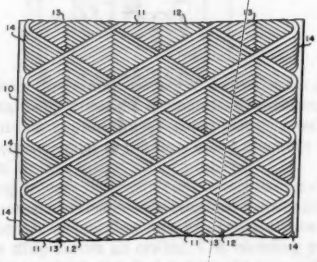
A tire comprising a polyester casing ply cord, a nylon breaker or cap ply cord, the breaker or cap ply consisting of at least two layers, the rubber used in the above plies being vulcanizable and comprising at least 20 percent stereo-regular polybutadiene or stereo-regular styrene-butadiene containing carbon black. The tread is formed of a vulcanizable rubber containing specific proportions of stereo-regular polybutadiene or stereo-regular styrene-butadiene rubber containing carbon black with a maximum particle size. High speed durability is greatly improved.

3,674,079

METHOD FOR PRODUCING ENDLESS REINFORCEMENTS FOR VULCANIZED PNEUMATIC TIRES

George C. Varner, Spartanburg, S.C., assignor to Deering Milliken Research Corporation, Spartanburg, S.C.

Division of Ser. No. 812,766, April 2, 1969, Pat. No. 3,589,426. This application Oct. 23, 1970, Ser. No. 83,294
Int. Cl. B29h *17/02, 17/08*; B60c *5/08*
U.S. Cl. 152—361 **5 Claims**



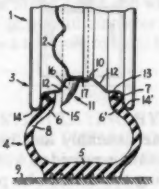
The endless reinforcement for a pneumatic tire of the present invention comprises continuous cord forming a generally zigzag pattern and being positioned across the width of the reinforcement from one side to the other at an angle to the edges of the reinforcement with reversals at the edges. Lengths of the cord between the reversals are interleaved with lengths disposed in an opposite direction along at least one line substantially parallel to and intermediate the edges thereof. Also, a method for producing a tire including such reinforcement and the resulting tire.

3,674,080

WHEEL FOR HIGH-SPEED CORNERING

Henri Verdier, Beauregard-l'Eveque, France, assignor to Compagnie Generale Des Etablissements Michelin raison Sociale Michelin & Cie, Clermont-Ferrand (Puy-de-Dome), France

Filed Feb. 11, 1970, Ser. No. 10,563
Claims priority, application France, Feb. 19, 1969, 6904236
Int. Cl. B60c *5/00*; B60b *21/10*
U.S. Cl. 152—375 **6 Claims**



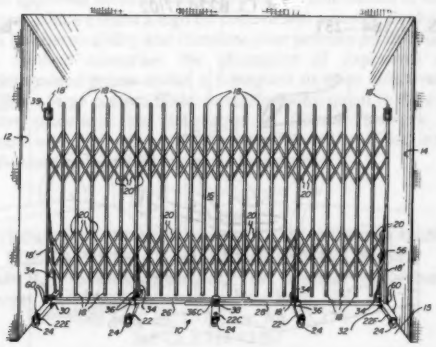
A wheel rim for an automotive vehicle is formed with an annular element upstanding from it and surrounding it. The annular element has a maximum diameter at least as great as the diameter of the bead seat and no greater than the diameter of the rim flange and is positioned to engage the inner surface of the outer bead of a tubeless tire when the tire is deformed as in high-speed cornering. It thus supports the bead and prevents unwedging thereof and consequent loss of inflation air.

3,674,081

LOCKING MECHANISM FOR PORTABLE GATE

Herbert A. List, Flossmoor, Ill., assignor to List Industries Inc.

Filed Nov. 21, 1969, Ser. No. 878,866
Int. Cl. E06b *9/08*
U.S. Cl. 160—161 **3 Claims**



A portable gate of a conventional extensible and collapsible type is provided with facilities to enable the gate to be installed quickly and securely. Pivoted locking bars for holding the gate extended are provided with interference structure that interengages during final swinging movement of the bars

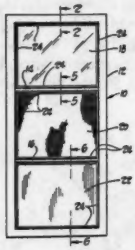
to force resilient bumpers into predetermined compression against the sidewalls that are bridged by the gate. Retainers on opposite ends of the gate engage floor anchors during final extension of the gate to provide vertical interlocks in accordance with an additional optional feature.

3,674,082

STORM DOOR GLAZING BEAD

Frank M. Letarte, 9094 Yager Road, Smith Creek, Mich.

Filed Feb. 17, 1969, Ser. No. 799,579
Int. Cl. E06b *3/54*
U.S. Cl. 160—371 **3 Claims**



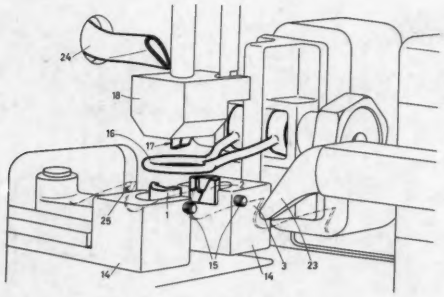
A panel and frame assembly and method for producing same in which the frame is provided with a longitudinally extending channel facing the area to be paneled. The panel is secured by a strip extending longitudinally of the frame and engaging the channel in snap-fitting relationship. In securing solid panels in the frame, the strip is secured in the channel by a cam-lock and has double spring action in which a portion of the strip acts in compression, while another portion acts in tension. In securing fabric panels into the frame, the spring and cam action is the same. Additionally, the portion of the strip which acts as the cam-lock engages a fabric.

3,674,083

APPARATUS FOR PROVIDING A CUTTING TOOL WITH A CUTTING PORTION OF A METAL HARDER THAN A BASE METAL OF THE CUTTING TOOL WHICH CARRIES THE CUTTING PORTION

Otto Stier; Heinz Kuhn, and Udo Vollmer, all of Biberach, Riss, Germany, assignors to Vollmer Werke Maschinenfabrik GmbH, Biberach/Riss, Germany

Filed April 29, 1968, Ser. No. 725,236
Claims priority, application Germany, April 27, 1967, V 33542; June 15, 1967, V 33870
Int. Cl. B22d *27/02*
U.S. Cl. 164—251 **6 Claims**



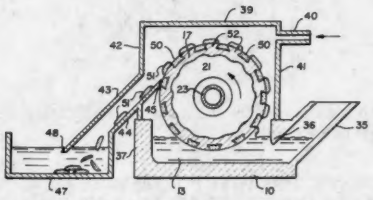
A method and apparatus for providing a cutting tool with a cutting portion of a metal harder than the base metal of the cutting tool which carries the cutting portion. The part of the base metal of the tool which is to carry the harder cutting portion is situated in a mold means made up of at least a pair of mold components movable toward and away from each other, and the harder metal initially is in the form of a powder which while it is in the mold means in engagement with the softer base metal is heated with the softer metal to an extent sufficient to cause the particles of the harder metal to melt and fuse to each other and to cause the harder metal to form an intimate bond with the softer metal, a suitable heating means being provided for this purpose to coact with the mold means. After the metal in the mold sets the mold components are moved apart from each other.

3,674,084

CHILL FOR DIRECT CASTING OF THIN PLATELETS

Eugene J. Paliwoda, Bethel Park, Pa., assignor to Jones & Laughlin Steel Corporation, Pittsburgh, Pa.

Filed June 18, 1970, Ser. No. 47,373
Int. Cl. B22d *15/04, 23/04*
U.S. Cl. 164—271 **5 Claims**



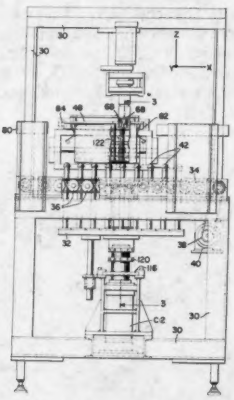
Apparatus for successively casting discrete thin platelets of metal includes a rotating internally fluid cooled cylindrical chill arranged so that the lower portion of its surface dips into molten metal. The chill surface is formed of successive circumferential areas of metal chill separated by circumferential areas of refractory material on which the molten metal does not solidify. A scraper is positioned to remove the solidified platelets from the chill and discharge them into a cooling medium.

3,674,085

MACHINE FOR CASTING BATTERY INTERCELL CONNECTORS

William R. Clingenpeel, Middleburg Heights; Charles L. Cain, Cleveland; Philip C. Hungerford, Jr., Cleveland Heights, and Robert R. Hayes, Euclid, all of Ohio, assignors to ESB Incorporated, Philadelphia, Pa.

Division of Ser. No. 643,574, June 5, 1967, Pat. No. 3,547,183.
This application Nov. 24, 1969, Ser. No. 870,415
Int. Cl. B22d *17/24*
U.S. Cl. 164—333 **2 Claims**

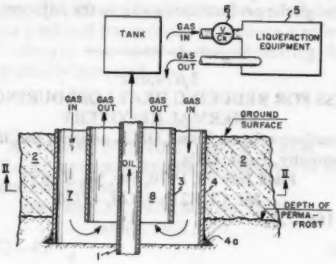


A machine for casting intercell connectors through the partition of open-top battery containers. The machine may also be used to cast intercell connectors which go over the tops of the partitions, and to cast battery terminal posts.

3,674,086
METHOD OF TRANSPORTING OIL OR GAS IN FROZEN TUNDRA

Alden W. Foster, 1207 Beaver St., Sewickley, Pa.

Filed Aug. 7, 1970, Ser. No. 61,982
Int. Cl. F25d *23/12*
U.S. Cl. 165—1 6 Claims

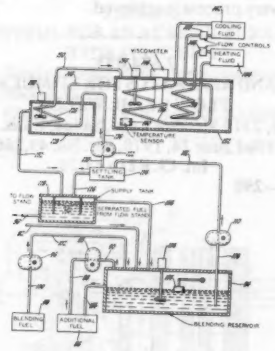


A method of preventing softening or thawing of the permafrost zone while producing or transporting hot oil or gas therethrough in which a liquefied hydrocarbon gas, preferably natural gas, is passed between the zone and the hot oil. The gas may be circulated in a suitable system.

3,674,087
FLOW PROCESS

Tracy R. Ackerman, Honeoye Falls, and John F. Schickler, Rochester, both of N.Y., assignors to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 722,653, April 19, 1968, Pat. No. 3,520,312. This application Nov. 28, 1969, Ser. No. 880,665
Int. Cl. F25b *13/00*
U.S. Cl. 165—2 1 Claim



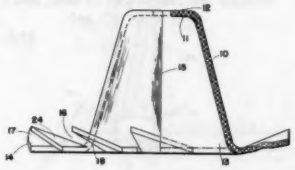
A carburetor flow stand, located in an enclosure containing air at substantially constant temperature, pressure and humidity, contains a plurality of sonic outlet nozzles which create a pressure signal in the flow stand chamber indicative of the rate of air flow through the carburetor.

A blending process supplies a continuous stream of test fuel to the carburetor at substantially constant density and viscosity so that the rate of fuel flow may be accurately measured by the pressure drop across an orifice. The blending process includes a step in which the fuel is brought to a substantially constant temperature for accuracy in the viscosity measurement.

3,674,088
TEST HOLE PLUG

Kenneth Vernon Ovelson, 10678 - 63rd St., Edmonton, Alberta, Canada

Filed Jan. 21, 1971, Ser. No. 108,453
Int. Cl. E21b *33/12*
U.S. Cl. 166—192 6 Claims

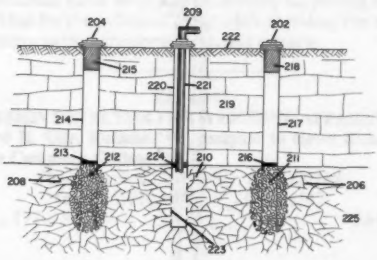


A flexible plastic truncated cone shaped body is provided with an annular flange at the upper end which is radially slitted to permit a decrease in overall diameter of the rim when the device is inserted into a test hole to close it off.

3,674,089
METHOD FOR STIMULATING HYDROCARBON-BEARING FORMATIONS

Ted R. Moore, Ruston, La., assignor to Cities Service Oil Company, Tulsa, Okla.

Filed Sept. 10, 1970, Ser. No. 70,975
Int. Cl. E21b *43/26*
U.S. Cl. 166—245 11 Claims



An approved method is disclosed for the stimulation of formations which exhibit a high oil content and porosity, but having a low permeability and therefore poor primary production. The method comprises the placement of explosives at predetermined points within a formation so as to effectively fracture a large portion of the formation subsequent to the explosive placement and detonation. A fracture network is created with interwell communication. A well is drilled into the fracture zone and oil produced therefrom.

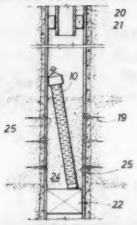
3,674,090
METHODS FOR INHIBITING THE ENTRANCE OF LOOSE FORMATION MATERIALS INTO A WELL BORE

Harold J. Urbanosky, Pearland, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Sept. 18, 1970, Ser. No. 73,278
Int. Cl. E21b *43/02*
U.S. Cl. 166—276 9 Claims

As a representative mode of practicing the methods of the invention disclosed herein, a tubular screen is lowered through a production string and packer and positioned in a well bore adjacent to a perforated formation interval containing loose formation materials. To inhibit the production of such materials as the well is produced, a mixture of loose

materials and a hardenable consolidating agent is then deposited around the tubular screen so as to fill the perforated well bore interval leaving only the upper portion of the screen projecting above the annular body of deposited materials. In



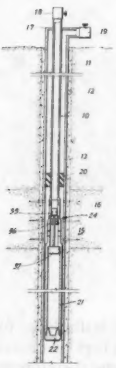
this manner, once the consolidating agent hardens, production can be commenced through the permeable plug of consolidated materials into the screen and out its exposed upper end.

3,674,091

METHODS AND APPARATUS FOR COMPLETING PRODUCTION WELLS

James W. Kisling, III, Houston, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed June 3, 1970, Ser. No. 43,064
Int. Cl. E21b *43/00*
U.S. Cl. 166—314 **18 Claims**



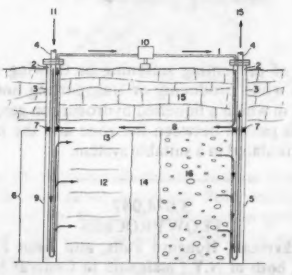
This application discloses new and improved methods and apparatus for completing production wells having perforations which either are to be cleaned or penetrate earth formations which are to be fractured, acidized, or treated such as, for example, to inhibit the subsequent production of unconsolidated formation materials. To practice the present invention, a new and improved production tool is arranged for coupling into a string of production tubing and includes a typical well packer having an elongated tubular member dependently coupled therebelow and capped at its lower end for defining an enclosed chamber of a substantial volume and which is initially maintained at a reduced pressure by new and improved normally-closed pressure-actuated valves serially arranged at the upper end of the tubular member and adapted to be selectively opened in succession. The production string and the tool are installed in a cased well bore with the packer being set above a previously-perforated interval traversing an earth formation which is to be subsequently produced. Once the customary wellhead equipment is installed to provide selective communication from the surface with the tubing and casing, the first of the two normally-closed valves is selectively opened by increasing the pressure of the well bore fluids in the production string above the packer. Upon opening of this first valve, formation fluids will be suddenly exhausted into the reduced-pressure chamber for removing contaminants that may have previously entered the formation following the perforation of the casing so as to leave only uncontaminated formation materials immediately surrounding the perforations. Thereafter, the second normally-closed valve is selectively opened by injecting selected fluids by way of the production string through the perforations and into the adjacent earth formations.

3,674,092

PROCESS FOR REDUCING HEAT LOSS DURING IN SITU THERMAL RECOVERY

Pratip Bandyopadhyay, Tulsa, Okla., assignor to Cities Service Oil Company, Tulsa, Okla.

Filed July 23, 1970, Ser. No. 57,633
Int. Cl. E21b *43/24, 43/26*
U.S. Cl. 166—271 **4 Claims**



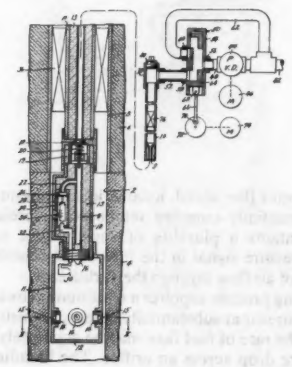
A continuous blanket of an inert gas is introduced between the hydrocarbon bearing reservoir and the overburden rock. The gas in injected in either a countercurrent or co-current direction with the progress of the thermal recovery front. By this injection an insulation medium is provided by the inert non-condensable gas such that heat losses to the overburden rock are reduced to a nominal amount and a more efficient thermal recovery process is achieved.

3,674,093

METHOD AND APPARATUS FOR STIMULATING THE FLOW OF OIL WELLS

Dale C. Reese, 2319 Meadow Lane, Salina, Kans.

Filed June 24, 1970, Ser. No. 49,266
Int. Cl. E21b *43/26*
U.S. Cl. 166—299 **8 Claims**



A method for stimulating the flow of oil wells consisting of sealing off a portion of the well shaft within the oil-bearing for-

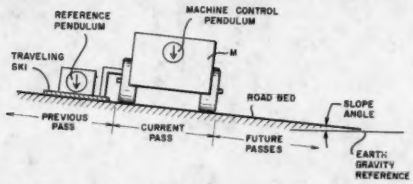
mation of the ground, introducing a combustible fuel not requiring additional oxygen for its combustion into the sealed-off portion of the well shaft and igniting said fuel; and an apparatus capable of performing said method. The combustion produces heat, which tends to melt or burn out sludges, tars, or the like which may be clogging the oil flow passages of the formation, and also produces sudden large quantities of gaseous products of combustion, in a manner similar to a low-order explosion, which fractures the formation to form new flow passages. The flow rate of the fuel may be gradually increased, and rendered intermittent to produce a series of "explosions," whereby the zone of the oil-bearing formation treated is gradually increased.

3,674,094

AUTOMATIC SLOPE CONTROLLER

Leland E. Kuntz, Arlington Heights, Ill., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Aug. 31, 1970, Ser. No. 68,290
Int. Cl. E02f *3/76*
U.S. Cl. 172—4.5 **10 Claims**



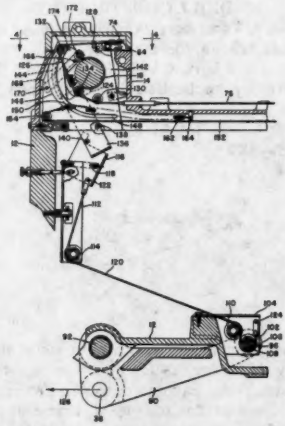
A controller for a road finishing machine which is adapted to match the slope of the surface presently being prepared to the slope of an adjacent surface previously prepared embodying a first means for sensing the slope of the previously prepared surface, a second means for sensing the slope of the surface currently being prepared and control means for comparing the outputs of the two sensors and for providing an error signal indicative of the difference of the two slopes.

3,674,095

SERVO-CONTROL FOR AN AGRICULTURAL TRACTOR HYDRAULIC LIFT

John Nelson Roger, Cedar Falls, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Oct. 26, 1970, Ser. No. 83,940
Int. Cl. A01b *63/112*
U.S. Cl. 172—7 **21 Claims**



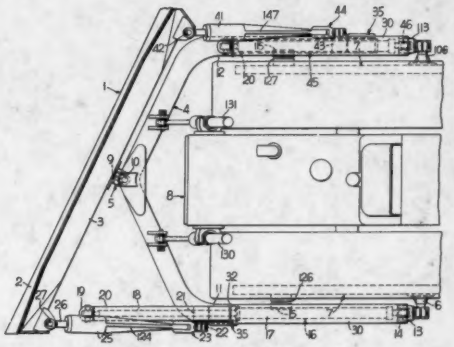
A cable and sheave (or equivalent) system for operating the valve means of a tractor hydraulic lift to regulate the position of the associated implement according to (a) load or draft, (b) depth or position and (c) a combination or "mixture" of (a) and (b).

3,674,096

BULLDOZER BLADE MOUNTING

David A. Berg, Milwaukee, Wis., assignor to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

Filed June 8, 1970, Ser. No. 44,099
Int. Cl. E02f *3/76*
U.S. Cl. 172—805 **10 Claims**



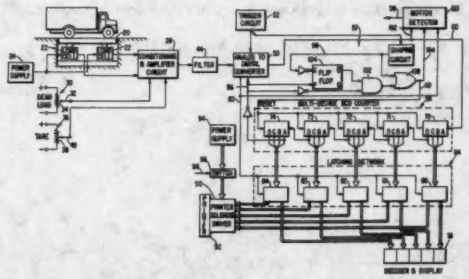
A bulldozer blade mounting for slidably supporting the ram assemblies for the bulldozer blade while shielding the hydraulic actuator as the actuator extends and retracts.

3,674,097

MOTION DETECTOR FOR WEIGHING APPARATUS

Richard H. Gile, Rutland, Vt., assignor to Howe Richardson Scale Company, Clifton, N.J.

Filed March 12, 1971, Ser. No. 123,764
Int. Cl. G01g *23/10, 23/365, 23/37*
U.S. Cl. 177—3 **25 Claims**



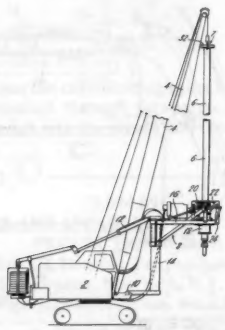
A detector for detecting the change in the number of pulses in serially applied pulse streams by memorizing a function representing the preceding one of the two pulse stream and by comparing the memorized function with a corresponding function of the subsequentially occurring one of the two pulse streams. This detector is, among other things, applicable to sense relatively small movements of a load-receiving structure (such as a weigh hopper or platform) in a weighing system.

3,674,098

DRILLING RIGS

James Russell Virgo, Belstead, England, assignor to The British Steel Piling Company Limited, Claydon, Ipswich, Suffolk, England

Filed Nov. 2, 1970, Ser. No. 86,251
Claims priority, application Great Britain, Nov. 3, 1969, 53,800/69
Int. Cl. E26c 5/10
U.S. Cl. 173—149 7 Claims



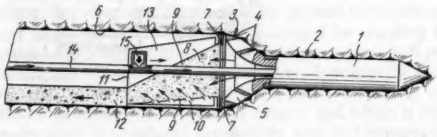
A drilling rig has a fluid pressure crowding device operated through a pressure accumulator so that no external energy input is required to maintain the crowding action during drilling. By use of differential piston crowding rams, the accumulator can be arranged in a closed circuit and the rams moved against its crowding action when it is required to reposition the drill shaft drive member through which the crowding action is transmitted.

3,674,099

DEVICE FOR MAKING HOLES IN THE GROUND

Alexandr Dmitrievich Kostylev; Konstantin Stepanovich Gurkov; Khaim Berkovich Tkach, and Lazar Moiseevich Lipovetsky, all of Novosibirsk, U.S.S.R., assignors to Institut Gornogo Dela Siberskogo otdelenia Akademii, Nauk SSSR, U.S.S.R.

Filed Dec. 30, 1970, Ser. No. 102,675
Int. Cl. E21b 11/02, 9/22
U.S. Cl. 175—20 4 Claims



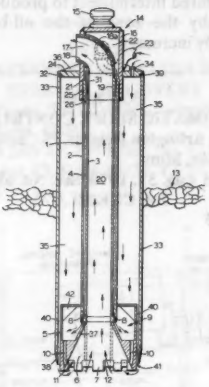
A device for making holes in the ground has a driving unit adapted to compact the ground and mounting an expansion reamer with an adjoining hopper adapted to receive the ground broken by the reamer, said hopper being provided with pneumatic means for the removal of the ground from the hopper outside the hole.

3,674,100

METHOD AND APPARATUS FOR DRILLING AND CASING A LARGE DIAMETER BOREHOLE

Norman D. Becker, 3208-25th St. S.W., Calgary, Alberta, Canada

Filed Aug. 12, 1970, Ser. No. 63,189
Int. Cl. E21b 1/00, 21/04
U.S. Cl. 175—69 7 Claims



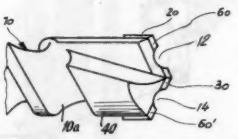
A method and apparatus for impact drilling and casing a large diameter borehole is described utilizing a drill pipe having an outside diameter smaller than the diameter of the borehole. The apparatus includes a double walled drill pipe with an annular bit having a diameter at its radial cutting edge equal to the diameter of the borehole, an anvil cap assembly at the upper end of the drill pipe and a casing having an outside diameter equal to the diameter of the borehole mounted over the drill pipe and drill bit and coaxially therewith. While the anvil is subjected to impact energy, compressed air at relatively low pressure is passed down the annular passage of the drill pipe, through passages in the bit and into the axial bore of the bit while water at relatively high pressure is passed between the drill pipe and casing. The water passes into the axial bore of the bit through spaces between the bit teeth and passes upwardly through the central passage of the drill pipe together with the compressed air and borehole fragment.

3,674,101

DRILL CONSTRUCTION

Franz Chromy, Vorarlberg, Austria, assignor to Hilti Aktiengesellschaft, Schaan, Liechtenstein

Filed April 8, 1970, Ser. No. 26,677
Claims priority, application Germany, April 28, 1969, P 19 21 677.4
Int. Cl. E21c 13/00
U.S. Cl. 175—389 6 Claims



A spiral or twist drill having a hard metal cutting edge and particularly useful for drilling concrete or artificial stone includes a cutting edge having a centering projection of a diameter which is smaller than the outside diameter of the drill. The cutting edge is formed by a hard metal plate which is secured such as by soldering within a cross groove of the drilling head.

The centering tip is formed either by a separate hardened metal element which projects outwardly from the center of the cutting plate or is defined by notches which are formed on each side of a central centering tip portion of the hard plate.

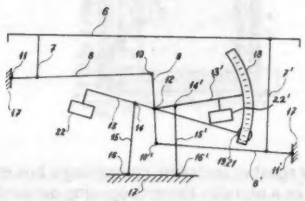
ERRATUM

For Class 177—3 see:
Patent No. 3,674,097

3,674,102
PLATFORM BALANCE

Peter Bommer, Zurich, and Hans Menzi, Stafa, both of Switzerland, assignors to Mettler Instruments AG, Zurich, Switzerland

Filed Aug. 30, 1971, Ser. No. 175,898
Claims priority, application Switzerland, Dec. 4, 1970, 17919/70
Int. Cl. G01g *21/18, 21/24, 1/28*
U.S. Cl. 177—256 **12 Claims**

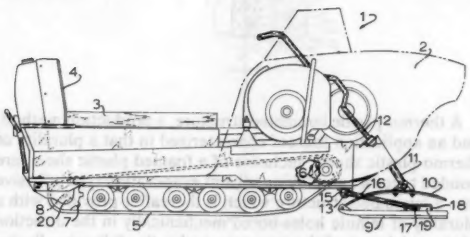


A platform balance including a housing, a weighing platform vertically movable relative to said housing, and at least one force indicating lever pivotally movable in accordance with the mass to be weighed by said balance, characterized in that the force indicating lever is pivotally supported in said housing beneath said platform at the upper end of a vertical support member the lower end of which is pivotally connected with the bottom wall of the housing, said force indicating lever being operable by the platform via load lever linkage means connected between the opposed side walls of the housing. In the illustrated embodiment, a pair of symmetrical force indicating levers are connected for pivotal movement in opposite directions to increase the sensitivity of measurement. Adjustable weight means are provided for varying the operating range of the balance, and tangent error is compensated for by appropriate selection of the dimensions and location of the center of gravity of the vertical support member.

3,674,103
SNOW VEHICLE ANTI-SWAY SUSPENSION SYSTEM

Elmer Carl Kiekhaefer, 2408 Cypress Gardens Road, Winter Haven, Fla.

Filed May 21, 1970, Ser. No. 39,434
Int. Cl. B62m *27/02*
U.S. Cl. 180—5 R **3 Claims**

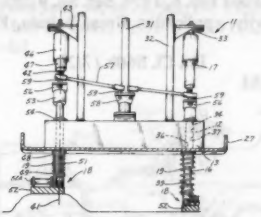


The spring mounted two front steering skis of a snowmobile are stabilized by a torsion bar having its ends universally and slidably connected to the corresponding skis and its central portion carried in bearings by the body of the vehicle. The suspension for the rear axle has end sprockets carrying the track or belt and is stabilized by employing a torsion bar at the pivotal axis for the suspension arms. The torsion bar is rigidly secured to the arms.

3,674,104
CUSHIONED SUPPORT MEANS

Frank T. Gostomski, 1053 N. Beech St., Wahoo, Nebr.

Filed Dec. 29, 1969, Ser. No. 888,420
Int. Cl. B62m *27/02*
U.S. Cl. 180—5 R **9 Claims**

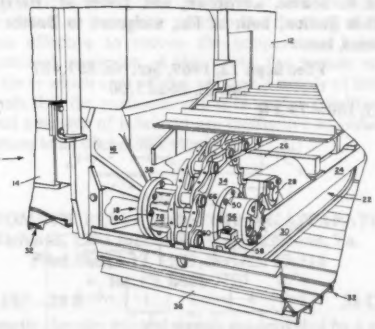


A cushioned support means for use with snowmobiles is provided which comprises two laterally aligned sleeves formed through the bottom of the snowmobile which have support shafts extending therethrough. A shock absorber is affixed to the upper end of each of the support shafts and a means for attaching skis is affixed to the lower end of each of the support shafts. Coil springs encircle each of the support shafts and urge the shafts downwardly. The support shafts are preferably rotatable about their longitudinal axes and movable upwardly and downwardly along these axes and are utilized as a portion of the steering apparatus for the snowmobile.

3,674,105
DRIVE AXLE FOR WIDE-TRACK CRAWLER VEHICLES

John Alfred Egli, Dubuque, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Oct. 30, 1970, Ser. No. 85,376
Int. Cl. B62d *55/12*
U.S. Cl. 180—9.48 **7 Claims**



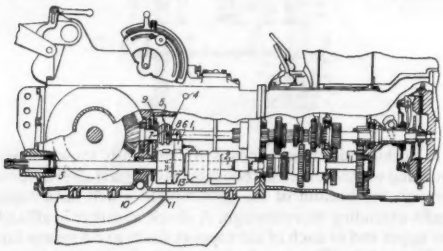
A crawler vehicle has a pair of extra wide, high-flotation tracks respectively supported on a pair of fore-and-aft extending track frames on opposite sides of the vehicle, the track frames being rigidly connected to the main frame. A pair of drive axles respectively extend outwardly a relatively short distance from a pair of final drive housings at opposite sides of the rear end of the main frame and the drive axles are respectively connected to a pair of rearward drive sprockets, which

drivingly engage the rear end of the tracks and are spaced outwardly from the ends of the axles, by means of a pair of axle extension members, the inner ends of which are drivingly connected to the outer ends of the axles by means of flexible couplings, which permit a small amount of tilting of the axle extension members relative to the drive axles. The outer ends of the axle extension members are respectively journaled in the respective track frames by means of self-aligning bearings, which accommodate the tilting of the axle extension members.

3,674,106
CONTROL FOR POWER TAKE-OFF

Alfred W. Thomas, Earl Shilton, England, assignor to Massey-Ferguson Services N.V., Curacao, Netherlands Antilles

Filed Feb. 6, 1970, Ser. No. 9,297
Claims priority, application Great Britain, Feb. 13, 1969, 7,760/69
Int. Cl. B60k *17/28*
U.S. Cl. 180—53 **5 Claims**

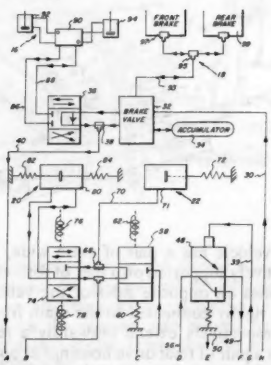


A vehicle has a P.T.O. transmission comprising a main drive shaft rotatable at a speed proportional to the ground speed of the vehicle, an auxiliary shaft rotatable at a speed proportional to the speed of the engine, and a P.T.O. shaft selectively connectible to each of said shafts through first and second clutches, respectively. Clutch operating means have a first-clutch operating position, a second-clutch operating position and a neutral position for selectively providing two P.T.O. speeds or neutral. A brake on said P.T.O. shaft is operable by the clutch operating means when the latter is the neutral position to immobilize the P.T.O. shaft and enable connection of implement drive shafts.

3,674,107
HYDRAULIC SYSTEM FOR A VEHICLE

Gerard R. Santos, Levittown, and James M. Herring, Jr., Merion Station, both of Pa., assignors to Boothe Airside Systems, Inc.

Filed Sept. 12, 1969, Ser. No. 857,427
Int. Cl. B62d *5/00*
U.S. Cl. 180—79.2 R **7 Claims**

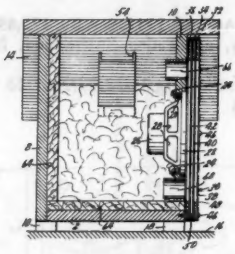


A hydraulic system provides steering, transmission shifting and braking for a vehicle. A first pump provides fluid power for steering and said braking. A second pump provides fluid power for the transmission shifting in the vehicle. Means responsive to the failure of the first pump causes the second pump to provide the power for the steering and braking of the vehicle as well as continuing to apply the power for transmission shifting.

3,674,108
OUTDOOR SPEAKER ENCLOSURE

David L. Beatty, 4832 Adams, Shawnee Mission, Kans.

Filed Oct. 29, 1970, Ser. No. 85,199
Int. Cl. G10k *13/00*; **H04r** *1/28*
U.S. Cl. 181—31 B **8 Claims**

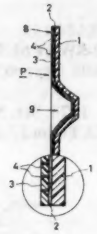


An outdoor speaker enclosure comprising a box enclosing a loudspeaker, or a plurality thereof, opening outwardly of said box, and a cover for the speaker opening specially formed to resist the entry of moisture therethrough but being porous to permit the unobstructed egress of sound therethrough, said box having specially formed vents providing both for effective ventilation of the box interior and also for improving the sound reproduction quality of the speaker.

3,674,109
THERMO-PLASTIC LAMINATED STRUCTURE

Yoshihiko Murase, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Japan

Filed Aug. 19, 1970, Ser. No. 65,204
Claims priority, application Japan, Aug. 27, 1969, 44/67154; Aug. 26, 1969, 44/66910; Aug. 26, 1969, 44/66911
Int. Cl. B32b *1/00, 3/10*; **G10k** *13/00*
U.S. Cl. 181—32 R **1 Claim**



A thermo-plastic laminated structure, a production method, and an application thereof characterized in that a plurality of thermo-plastic sheets, inclusive of a foamed plastic sheet, are bonded together employing solvent evaporation type adhesive into a laminated structure which is thereafter provided with a plurality of minute holes bored mechanically in the direction of the thickness of the structure under the following limitations:

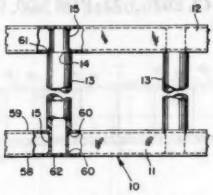
1. The holes thus bored reach the adhesive layer interposed between the component plastic sheets, whereby one or both sides of said adhesive layer are communicated with

the outside atmosphere through said plurality of holes; and

2. The holes, however, do not penetrate the thermoplastic structure totally, whereby both sides of the thermoplastic structure are not communicated each other through these plurality of holes.

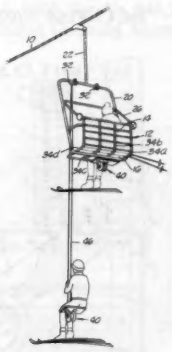
The structure is thereafter subjected to a curing process and vacuum formed into for instance a vibration plate of a loudspeaker.

3,674,110
WOUND FILAMENT LADDER
Robert F. Cooke, Candia, N.H., assignor to Unitec Industries, Inc., Cockeysville, Md.
Filed June 1, 1970, Ser. No. 41,895
Int. Cl. E06c 7/08
U.S. Cl. 182—46 **4 Claims**



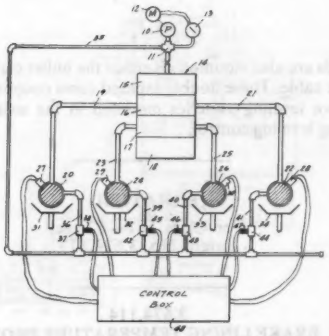
Several embodiments of ladder construction, fabricated by a filament winding process are shown, wherein a continuous glass filament is wound at a controlled helical angle on suitable mandrels and bonded with an epoxy or polyester resin system. Circular, elliptical or rectangular cross-section members can be developed for the rungs and rails and glass fabric or longitudinal fiber members may be combined therewith for additional strength. The rungs and rails are machined and joined with a resin bonding agent and the assembly cured in single section, extension ladder, or section ladder configurations. In the latter, reinforcement of the notched ends is made with plies of resin impregnated glass strips filling the rail cavity in conformity with the notch.

3,674,111
EMERGENCY EVACUATION MEANS FOR SKI CHAIRLIFTS
Ernest Weissberg, 11646 Chenault St., Los Angeles, Calif.
Filed March 8, 1971, Ser. No. 121,717
Int. Cl. A62b 1/02
U.S. Cl. 182—72 **10 Claims**



An emergency means or system for evacuating or lowering persons from stalled ski chairlifts. A small, separable platform is attachable to the chair frame. It carries a reel of cable, one end of which is attached to the platform and the other end to the reel. The cable cam be looped over a hook on the chair; the platform can be separated or detached, and then a person can lower himself while sitting on the platform which has a braking device associated with the cable whereby the person can control the rate of descent. The reel includes a spring drive for automatically returning the platform to the chair and rewinding the cable on the reel.

3,674,112
CENTRALIZED LUBRICATION SYSTEM
Robert D. Roberts, Streetsboro, Ohio, assignor to Houdaille Industries, Inc., Buffalo, N.Y.
Filed June 30, 1970, Ser. No. 51,059
Int. Cl. F01m 11/10; F16n 17/02
U.S. Cl. 184—6.1 **8 Claims**

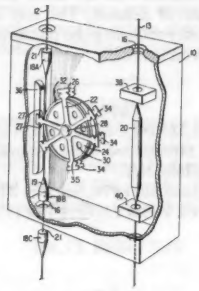


A centralized lubrication system of the type in which a distributor periodically injects a predetermined quantity of lubricant to each of a plurality of lubrication sites in a predetermined sequence, including sensor means associated with each of the sites, a control means which receives signals from each of the sensor means, and an auxiliary delivery means actuated by the control means to inject additional amounts of lubricant to flood the lubrication site when the sensor associated with that site indicates that an excessive temperature has been reached. The control means may also include means for resetting the sensors after the condition of excessive temperature is reached to determine whether the flooding of the site has been effective to reduce the temperature below the predetermined maximum. Additionally, the system may include a timer which cuts off the additional supply of lubricant and signals that the particular site is in such a condition that additional amounts of lubricant are ineffective to reduce the temperature to an acceptable value.

3,674,113
AUTOMATIC ELEVATOR STOPPING APPARATUS
Sidney Richmon, 1202 Peachtree Blvd., Richmond, Va.
Filed March 13, 1970, Ser. No. 19,318
Int. Cl. B66b 1/50
U.S. Cl. 187—29 R **35 Claims**

Automatic elevator control signals are provided by a system of switches and wire mounted cams. A cable extends along the length of the elevator shaft and passes through a switch box mounted on the elevator. Mounted on the cable are a separate pair of bullet shaped cams for each floor serviced by the elevator. These cam-pairs cooperate with a star switch mounted in the switch box; and, depending upon the direction of the elevator motion, the first cam in each pair turns the star switch one increment as the elevator approaches a floor. And the star switch provides elevator control circuits with floor registration

and slowdown information. If the star switch gets out of step with the elevator's location, a specially modified rack and pinion correct the position of the star switch when the elevator reaches either end of the shaft. Cams which are tapered at

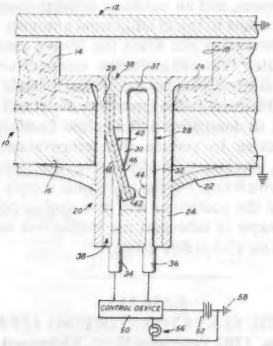


both ends are also mounted on either the bullet cam cable or a separate cable. These double-tapered cams cooperate with up and down leveling switches mounted in the switch box for providing leveling control.

ERRATUM

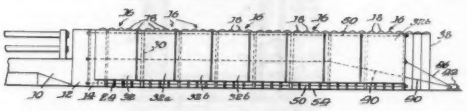
For Class 187—67 see:
Patent No. 3,674,117

3,674,114
BRAKE LINING TEMPERATURE PROBE
Donald W. Howard, South Bend, Ind., assignor to The Bendix Corporation
Filed Sept. 11, 1970, Ser. No. 71,529
Int. Cl. F16f *66/00*
U.S. Cl. 188—1 A **4 Claims**



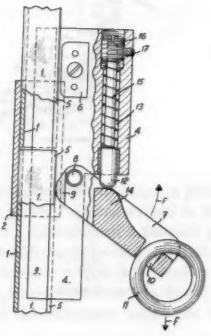
A probe carried in a brake shoe is responsive to the temperature of the lining material and is also responsive to wear of the lining material in excess of a predetermined amount. The probe includes a housing in thermal communication with the lining material and in electrical communication with the rounded brake shoe backing plate. A loop of wire is carried in the probe and is connected to an indicating device in the operator's compartment of the vehicle through an appropriate control device. When the friction material has worn a predetermined amount, the wire loop is brought into engagement with the member to be braked, thereby actuating the indicating device only while the brake is applied. Subsequent wear of the lining material severs the wire loop to actuate the indicating device at all times while the vehicle's ignition is on. One end of a bi-metallic metal strip is secured to the housing and the other end of the bi-metallic strip is spaced a predetermined distance from a terminal affixed to the wire loop. As the temperature of the brake lining increases, the other end of the bi-metallic strip is brought into engagement with the terminal, thereby providing an electrical circuit between the wire loop and the grounded brake shoe backing plate, thereby actuating the indicating device.

3,674,115
LIQUID SHOCK ABSORBING BUFFER
Bruce O. Young; Grant W. Walker, both of Sacramento; Duane B. Ford, Placerville, and Wan Seegmiller, El Dorado, all of Calif., assignors to Energy Absorption Systems, Inc., Chicago, Ill.
Filed Sept. 23, 1970, Ser. No. 74,736
Int. Cl. E02b *3/22*; **F16f** *5/00, 9/08*
U.S. Cl. 188—1 B **16 Claims**



A reuseable impact attenuation construction designed to protect fixed objects near highways or vehicular traffic routes from damage due to high velocity impact. The invention comprises a plurality of collapsible, incompressible fluid filled energy absorbing and dissipating buffer elements separated by collapsible panel and diaphragm means whereby the force of impact of a colliding vehicle compresses the aforesaid structure, causing a pressure build-up in the fluid filled buffer elements which are sandwiched between the panel and diaphragm means. The energy of impact is dissipated in said buffer elements by the controlled escape of fluid therefrom through a series of sharp edged orifices. The internal pressure in the buffer elements creates a resisting force which dissipates the kinetic energy of the impacting vehicle and brings it to a safe, controlled stop without damage to said fixed object and without injuring the occupants of the vehicle.

3,674,116
FALL-PREVENTION SAFETY DEVICE
Rudolf Vogeli, Wettingen, Switzerland, assignor to Lebag Leitungs-Und Elektrobau AG, Wettingen, Switzerland
Filed Sept. 28, 1970, Ser. No. 76,006
Claims priority, application Switzerland, Oct. 9, 1969, 15,146/69
Int. Cl. F16d *59/02*
U.S. Cl. 188—67 **6 Claims**



The invention concerns a fall-prevention safety device comprising a shaped member permanently fixed along the path to

be covered; a slide member displaceable along the shaped member, and a locking device comprising an eccentric cam pivoted on a portion of the slide member and provided with a coupling member. The active portion of the cam is able to be displaced between an inoperative position in which the slide member is displaced freely along the shaped member, and a locking position in which a portion of the shaped member is gripped between said cam and a portion of the slide member such that any relative displacement between the shaped member and the slide member is prevented.

3,674,117

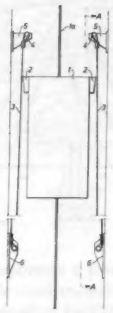
SYSTEM FOR ARRESTING THE MOVEMENT OF OBJECTS TRAVELING ALONG A DEFINED PATH

Gosta Sjostrom, deceased, late of Marknadsvagen 63, Taby, Sweden; Ruth Sjostrom; Kjell Sjostrom, and Bjorn Sjostrom, (heirs), all of Marknadsvagen 63, 183 Taby 34, Sweden

Filed Oct. 7, 1970, Ser. No. 78,855

Int. Cl. B66b *5/28*

U.S. Cl. 187—67 **3 Claims**



An emergency system for arresting the movement of a traveling object such as an elevator car wherein the momentum of the object is absorbed by the physical extension of elongated metal members engaged by the moving object. Two or more of the elongated metal members are provided on each side of the path of the object with one end of such members being restrained against movement in at least one direction and the other end being engaged by a projection provided for that purpose on the object and free to move with the object and impart extension to the metal members.

3,674,118

FULL DISC BRAKE WITH ROTATING BRAKE DISCS

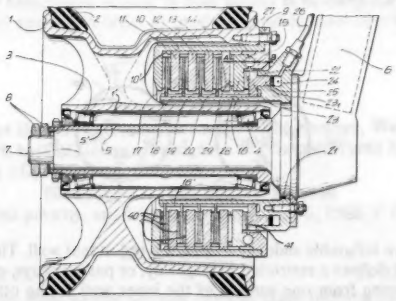
Hermann Klaue, Tour D'Ivoire 24e,, Montreaux, Switzerland

Filed Aug. 1, 1969, Ser. No. 846,703

Claims priority, application Germany, March 27, 1969, P 19 15 651.5

Int. Cl. F16d *55/48*

U.S. Cl. 188—72.2 **10 Claims**



A disc brake having a plurality of braking discs which engage each other to brake a rotatable member. An actuating disc at one end of the brake cooperates with raised surfaces and rolling elements such that upon limited rotational movement of the actuating disc the brake discs are urged together to effect the braking. A fluid or manually operable piston engages a lateral surface of the actuating disc to cause the said limited relative rotation thereof to effect braking.

3,674,119

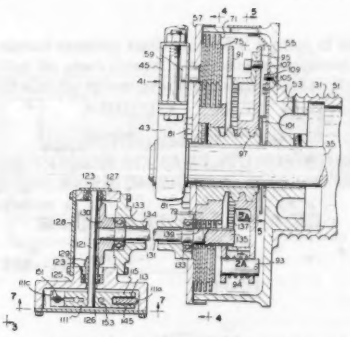
WINCH BRAKING MECHANISM

Wayne C. Worstell; Richard C. Cousins, and Eugene A. Cooley, all of Portland, Oreg., assignors to Dillingham Corporation, Honolulu, Hawaii

Continuation of Ser. No. 800,654, Feb. 19, 1969, abandoned. This application Dec. 9, 1970, Ser. No. 96,624

Int. Cl. B60f *7/12*

U.S. Cl. 188—134 **4 Claims**



A winch having an inertia responsive brake, and a velocity responsive actuator means also disposed in actuating relation to the said brake, wherein the actuator means is, at least to some extent, inertia responsive.

3,674,120

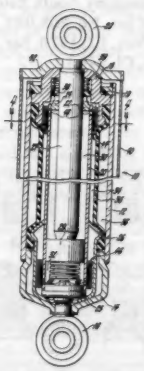
AUXILIARY SHOCK ABSORBER DAMPING VALVES

Ralph S. Johnson, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 1, 1971, Ser. No. 111,282

Int. Cl. F16f *9/52*

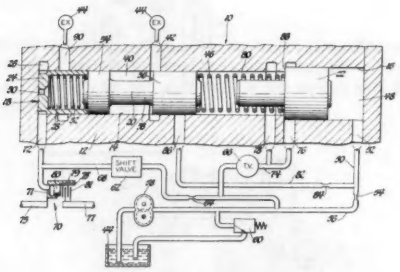
U.S. Cl. 188—277 **3 Claims**



In preferred form, a direct acting hydraulic shock absorber with auxiliary passages between the working chambers of the shock absorber and the reservoir chamber controlled by a thermally responsive valve which blocks fluid flow upon

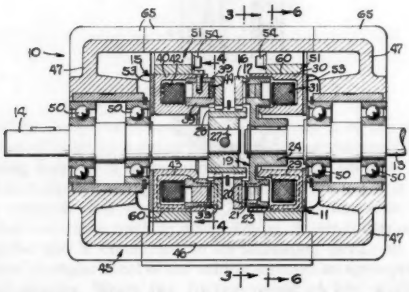
sensing a predetermined fluid temperature. An annular channel formed about the pressure cylinder of the shock absorber has a wall portion spaced radially outward from openings in the pressure cylinder and has openings to the reservoir chamber. A cylindrical ring valve in the annular channel is spaced inwardly from the wall portion when it is below the predetermined temperature. The ring valve expands outwardly against the wall portion to block the auxiliary passages to the reservoir chamber when above the predetermined temperature.

3,674,121
ENGAGEMENT CONTROL OF FRICTION DRIVES
Charles R. Copeland, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.
Filed Sept. 21, 1970, Ser. No. 73,757
Int. Cl. F16d *25/063*
U.S. Cl. 192—52 **8 Claims**



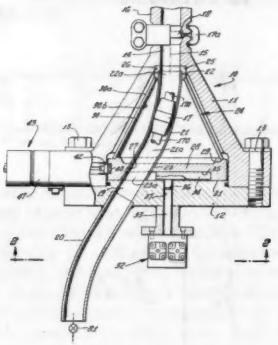
A friction drive establishing device having an engagement control valve for controlling the development of pressure therein. The control valve includes a regulator valve slidably disposed in a valve bore for controlling engagement pressure in the friction device and a bias member for imposing a bias force on the regulator valve during engagement. A control valve is in fluid communication with the bias member which control valve functions to decrease the bias pressure imposed on the bias member when the slip speed of the friction device approaches zero thereby reducing the engagement pressure to accommodate the increase in the coefficient of friction.

3,674,122
MAGNETIC FRICTION CLUTCH-BRAKE UNIT
Raymond A. Buisker, Rockford, Ill., assignor to Warner Electric Brake & Clutch Company, South Beloit, Ill.
Continuation-in-part of Ser. No. 808,089, March 18, 1969. This application Nov. 12, 1970, Ser. No. 88,758
Int. Cl. F16d *13/72*
U.S. Cl. 192—113 A **6 Claims**



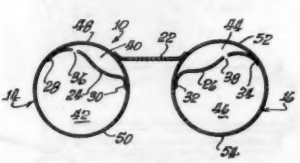
The magnet cores of a magnetically controlled friction clutch and brake are surrounded by and disposed in intimate heat-conducting contact with annular heat sinks which dissipate large quantities of heat from the clutch and brake by conducting the heat to and sinking the heat in a thermally conductive housing. The latter completely encases the operating elements of the clutch and brake and establishes a dust-tight enclosure around the elements so as to prevent both contamination from entering and wear particles from escaping the housing.

3,674,123
PIG DIVERTER
George E. Lewis, Arcadia, and Fernando Murman, Palos Verdes Peninsula, both of Calif., assignors to Hydril Company, Los Angeles, Calif.
Filed Aug. 20, 1970, Ser. No. 65,639
Int. Cl. B65g *11/00*; E21b *41/00*
U.S. Cl. 193—23 **15 Claims**



Apparatus enabling controllable diversion of tool passage between multiple pipes connectible with a single pipe comprises: a housing forming a primary port communicable with a primary pipe to pass the tool, the housing also forming a series of secondary ports respectively communicable with multiple secondary pipes selectively to pass the tool; and, means forming an elongated intermediate passage to pass the tool and having one end remaining in direct communication with the primary port and an opposite end selectively directly communicable with the secondary ports in response to controlled movement of the passage within the housing, the passage being protected.

3,674,124
FAIL-SAFE INFLATABLE SLIDE
James R. Summer, Brielle, N.J., assignor to The Garrett Corporation, Los Angeles, Calif.
Filed Aug. 21, 1970, Ser. No. 65,914
Int. Cl. B64d *25/14*
U.S. Cl. 193—25 B **11 Claims**



An inflatable slide member has a redundant wall. The inner wall defines a restricted passageway, or passageways, communicating from one surface of the inner wall to the other surface. Upon loss of pressure-holding-integrity of the outer wall, as by a puncture, the inner wall provides backup integrity to

maintain sufficient pressure for a necessary length of time to which the slide is put to use.

3,674,125

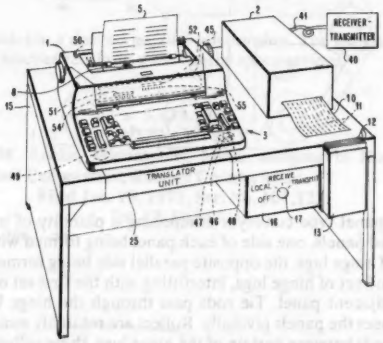
DATA SYSTEM WITH PRINTING, COMPOSING, COMMUNICATIONS, AND MAGNETIC CARD PROCESSING FACILITIES

Robert A. Kolpek, Lexington, Ky., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 802,700, Sept. 6, 1968, abandoned, which is a continuation of Ser. No. 623,053, March 14, 1967, abandoned. This application Dec. 19, 1969, Ser. No. 886,798

Int. Cl. B41j 5/30

U.S. Cl. 197—19 **16 Claims**



The apparatus incorporates a printing composer interconnected with a magnetic card recording and reproducing unit, and having telecomunication facilities. Provision is made for composing operations, including justification of printed information according to predetermined line lengths, centering, flush left, and flush right. The composing capabilities are in addition to basic recording and playback functions of the apparatus. Several modes of operation are possible. In a Record mode, characters and functional information entered by a keyboard produce data signals that are supplied to the magnetic card unit for recording in individual tracks on a magnetic card record media, each track being associated with a printed line on a document that is concurrently printed. During a Playback mode, data signals previously recorded in the individual tracks on the magnetic record card are sensed and applied to the printer to produce a printed document automatically. Neither the Record nor the Playback modes contemplate justification procedures. In a Justify Record mode, provision is made for recording characters and recognizing spaces as they occur during the printing of a document, compiling justification information to produce lines of predetermined length, and recording the justification data in association with the individual lines. In a Justify Playback mode, the previously recorded justification data is recognized and used during subsequent sensing of data signals to effect proper interword spacing in order to produce justified lines of printed copy.

3,674,126

TYPE HEAD DRIVE

Herbert Decker, Lauf, and Hermann Waldenburger, Wolkersdorf, both of Germany, assignors to Triumph Werke Nurnberg AG, Nurmberg, Germany

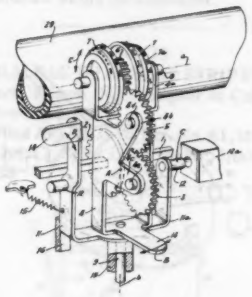
Filed June 27, 1969, Ser. No. 837,040

Claims priority, application Germany, July 6, 1968, P 17 61 790.2

Int. Cl. B41j 1/40

U.S. Cl. 197—55 **11 Claims**

A type head having circular rows of types forming curved columns, is rotated by a transmission about a first axis at the centers of the circular rows of types, and angularly displaced about a second axis for selecting a type of a curved column. The transmission includes a driving gear and a driven gear



having curved meshing teeth located at a point of the second axis, so that the gears remain in meshing engagement when the type head with the driven gear is angularly displaced.

3,674,127

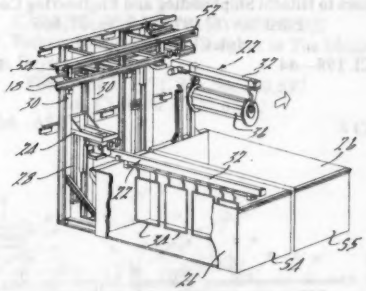
WORK CARRIER ACCUMULATION MECHANISM

Robert J. Juve, Sterling Heights, Mich., assignor to The Udylite Corporation

Filed Jan. 11, 1971, Ser. No. 105,531

Int. Cl. B23q 5/22

U.S. Cl. 198—19 **9 Claims**



A processing machine including rails on which a plurality of work carriers are movably mounted and are advanced therealong by means of a pusher mechanism engageable with an abutment on each work carrier. The work carriers are provided with a linkage mechanism for coacting with adjacent work carriers and cams disposed along the path of travel of the work carriers for moving the abutment out of engagement with the pusher mechanism whereby certain work carriers are temporarily retained in a stationary condition along selected locations of the processing machine as may be desired or required from time to time.

3,674,128

FEEDER FOR CYLINDRICAL OBJECTS

Dennis E. Mead, Cazenovia, N.Y.

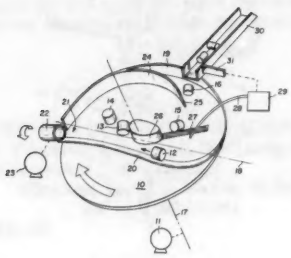
Filed Feb. 11, 1970, Ser. No. 10,529

Int. Cl. B65g 47/24

U.S. Cl. 198—33 AA **16 Claims**

Cylindrical objects are fed from a rotating disk that is tilted 10° to 15° from the horizontal. The objects are dropped onto the upper part of the disk, and a fixed orienting surface close to the top surface of the disk curves inward from the periphery of the disk in the direction of rotation and extends across the

lower part of the disk to a discharge region where the orienting surface is approximately radial to the disk. Objects that are properly oriented for discharge roll against the disk in sliding contact with the orienting surface and pass through a



discharge tube. Objects in other orientations frictionally engage the disk to be carried away from the discharge tube, guided around the disk, and tumbled into a new approach to the orienting surface.

3,674,129

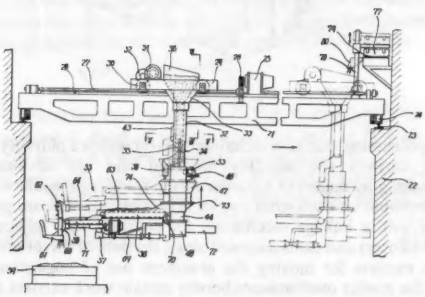
OVERHEAD TRAVELING SANDSLINGER

Yorio Ikuo; Minoru Okabayashi; Keisuke Ono; Yoshikazu Mizugaki, and Juntaro Hayashi, all of Osaka, Japan, assignors to Hitachi Shipbuilding and Engineering Co., Ltd.

Filed Nov. 6, 1970, Ser. No. 87,466

Int. Cl. B65g *37/00*

U.S. Cl. 198—44 **11 Claims**



An overhead traveling sandslinger for the production of relatively large molds in foundries, comprising a transversely movable carriage on an overhead traveling frame structure, a slinger liftably and revolvably suspended from said transversely movable carriage, the arrangement being such that the traveling movement of said frame structure, the transverse movement of said carriage and the lifting and revolving movements of said slinger cooperate with each other so that flask molding can be effected with respect to a flask disposed at any place within an area in a foundry without moving the flask. Molding sand is supplied to the slinger through the components of the apparatus.

3,674,130

CONVEYORS

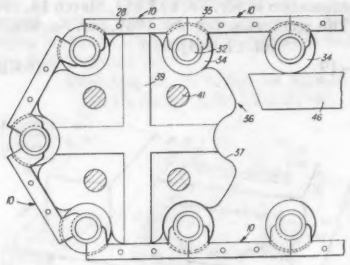
Alan Carmichael, Brookwood, England, assignor to Efco Limited, Woking, Surrey, England

Filed Sept. 8, 1970, Ser. No. 70,254

Claims priority, application Great Britain, Sept. 15, 1969, 45,448/69

Int. Cl. B65g *15/30*

U.S. Cl. 198—195 **6 Claims**



A panel type conveyor comprising a plurality of interconnected panels, one side of each panel being formed with a first set of hinge lugs, the opposite parallel side being formed with a second set of hinge lugs, interfitting with the first set of lugs of an adjacent panel. Tie rods pass through the hinge lugs and connect the panels pivotally. Rollers are rotatably mounted on the rods between certain of the hinge lugs, these rollers engaging in elongate sprockets and running on spaced apart rails between the sprockets to support the panels.

3,674,131

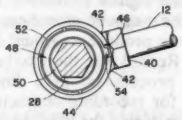
CONVEYOR CLEANER WITH ELASTOMER SPRING

Carl G. Matson, 401 E. Central Blvd., Kewanee, Ill.

Filed Jan. 22, 1971, Ser. No. 108,936

Int. Cl. B65g *45/00*

U.S. Cl. 198—230 **8 Claims**



An improved mount for a conveyor cleaner arm featuring a split tube about a torsionally elastic torus and wherein the arm is rigidly secured to the tube, as by welding, across the split or gap so as to fix the gap dimensionally whereby the gap provides a keyway to receive a key on the exterior of the torus.

3,674,132

CASSETTE RECEPTACLE

Michael Loss, 1879 Manor Drive, Union, N.J.

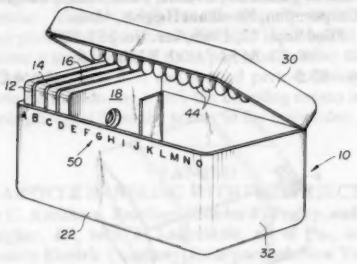
Filed Sept. 2, 1970, Ser. No. 68,823

Int. Cl. B65d *85/67*

U.S. Cl. 206—1 R **10 Claims**

A receptacle or the like for tape cassettes adapted to receive cassettes in interleaved fashion. The receptacle comprises partitions each of a width equal to the thickness of the abutments which protrude from the sides of tape cassettes and define the head portions or housings thereof. The partitions

are positioned and shaped to fit in the voids defined by juxtaposed interleaved receptacles to maintain the juxtaposed



receptacles in a desired parallel relationship. The interleaving of the cassettes results in a substantial space savings.

3,674,133

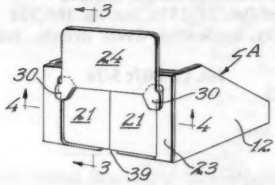
DISPLAY TRAY

Frank W. Locke, Minneapolis, Minn., assignor to Hoerner Waldorf Corporation, Ramsey County, Minn.

Filed Jan. 18, 1971, Ser. No. 107,123

Int. Cl. B65d *5/52*

U.S. Cl. 206—44 **7 Claims**



An open topped tray is provided having a double thickness rear wall. A portion of the outer layer of paperboard is cut to provide a display panel hinged to the remainder of this layer along a fold line spaced from the top of the rear wall. Ears are provided integral with the display panel and which, upon pivotal movement of the display panel, temporarily flex the layers apart. These ears hold the display panel either in the plane of the outer layer, or projecting above the top of the rear wall.

3,674,134

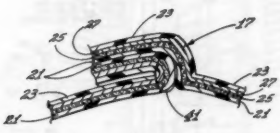
RUPTURABLE CONTAINER

Charles D. Turner, Laguna Beach, Calif., assignor to Kay Laboratories, Inc., Santa Ana, Calif.

Filed March 13, 1970, Ser. No. 19,202

Int. Cl. B65d *79/00*

U.S. Cl. 206—47 A **13 Claims**



A rupturable container including first and second layers of flexible sheet material bonded together to form a laminated sheet material construction. Preselected confronting regions of the first and second layers are bonded together less securely than the remaining regions of the laminate. The laminated sheet material is appropriately joined together to form a closed container which is adapted to contain a substance. The preselected regions may also be mechanically weakened. When the container is struck, the weakened region ruptures to expose the substance within the container.

3,674,135

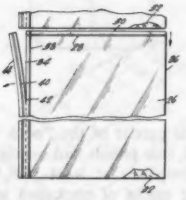
FLEXIBLE FILM BAG WITH TEAR STRIP FOR CLOSURE

Jean Ellen Simon, Edison, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Aug. 5, 1970, Ser. No. 61,319

Int. Cl. B65d *33/16*; **B65h** *55/00*

U.S. Cl. 206—58 **6 Claims**



A roll of separable bags for being sequentially dispensed from a carton comprising a two-ply strip of plastic film material having closed sides and heat seals and perforations for separating the strip into discrete bags. Extra heat seals and perforations are provided for conveniently packaging with the bags suitable ties or closure bands which may be colored and reinforced.

3,674,136

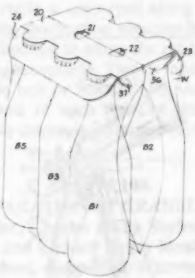
CARRIER FOR FLANGED ARTICLES

Homer W. Forrer, Jonesboro, Ga., assignor to The Mead Corporation, Dayton, Ohio

Filed June 1, 1971, Ser. No. 148,597

Int. Cl. B65d *71/00*, *85/62*

U.S. Cl. 206—65 S **8 Claims**



A carrier for flanged articles comprises a pair of main panels arranged in face contacting relation and disposed in overlying relation with respect to the articles and a pair of auxiliary panels are foldably joined to each of the main panels along opposite side edges thereof and apertures are formed in each of the auxiliary panels in close proximity to the upper ends of the adjacent articles. The auxiliary panels of the lower main panel are folded inwardly through angles substantially in excess of 90° so that the apertures therein at least partially envelop the upper ends of the adjacent articles. The auxiliary panels associated with the top main panel are folded downwardly through angles of 90° or less to positions wherein portions of the upper ends of adjacent articles are enveloped within the apertures formed therein so that each article is gripped below its flange from opposite sides by the auxiliary panels.

3,674,137
NECK THRU SAFETY LOCK

Earl J. Graser, Monroe, La., assignor to Olinkraft, Inc.

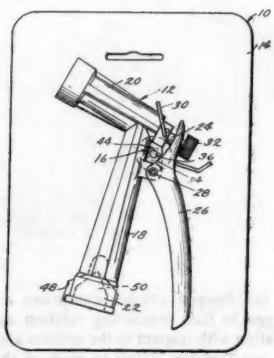
Filed March 23, 1970, Ser. No. 21,746
Int. Cl. B65d 71/00
U.S. Cl. 206—65 E 3 Claims

A multiple-article carrier of the "neck thru" variety comprising a top panel, side panels and overlapping end margins. The top panel comprises at least two terminal apertures through which the necks of packaged articles will extend. These apertures have associated therewith at least one retention tab hingedly attached near the periphery of the terminal aperture and extends into said apertures at the opposite end thereof. These tabs afford a secondary retention means and will prevent bottle fall-out when the carrier is used in a package.

3,674,138
CARDED NOZZLE PACKAGE

Robert A. Gilmour, Somerset, Pa., assignor to Gilmour Manufacturing Company, a division of R. M. Smith, Inc., Somerset, Pa.

Filed Jan. 21, 1971, Ser. No. 108,412
Int. Cl. B65d 73/00
U.S. Cl. 206—80 R 5 Claims

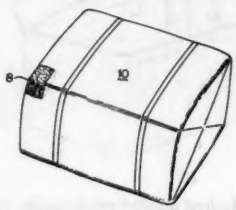


A package which comprises a hose nozzle including a handle portion and a barrel portion having an apertured web portion formed integrally therewith adjacent the juncture of the handle portion with the barrel portion, a card receiving the nozzle on one surface thereof, a fastener of nylon or the like extending through the card and through the apertured web portion with a press fit, the fastener including an enlarged head engaging the opposite side of the card and a tab formed in the card engaged within the socket formed in the free end of the handle portion.

3,674,139
COTTON BALE COVER

Arthur E. Manasian, Needham; Carl J. Papenfuss, Holliston, and William F. Piekarski, Dracut, all of Mass., assignors to Ludlow Corporation, Needham Heights, Mass.

Filed Sept. 12, 1969, Ser. No. 857,508
Int. Cl. B65d 71/00; B32b 3/10
U.S. Cl. 206—83.5 4 Claims

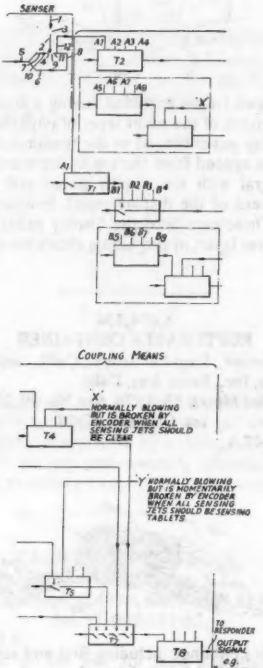


A nonwoven cotton bale cover formed of a bonded laminate of three layers of material. A grid-like layer of extruded or knitted filament net is sandwiched between two layers of cotton material, at least one of which is a nonwoven cotton fabric. The layers are adhesively bonded to the net to form a three-part laminar structure.

3,674,140
ARTICLE SENSING APPARATUS

Harold Thomas File, Gerrards Cross, England, assignor to Aspro-Nicholas Limited, Slough, England

Filed Dec. 21, 1970, Ser. No. 100,324
Claims priority, application Great Britain, Jan. 2, 1970, 163/70
Int. Cl. B07c 5/34
U.S. Cl. 209—73 10 Claims


SENSER
COUPLING MEANS
NORMALLY BLOWING BUT IS BROKEN BY ENCODER WHEN ALL SENSING JETS SHOULD BE CLEAR
NORMALLY BLOWING BUT IS MOMENTARILY BROKEN BY ENCODER WHEN ALL SENSING JETS SHOULD BE SENSING TABLETS
TO RESPONDER OUTPUT SIGNAL e.g. REJECT TABLET

Apparatus adapted to react to the presence or absence of articles at a location in a feed path, for example tablets in a

tablet-packaging machine, comprises a senser for sensing selectively the presence and absence of an article at the location, a responder adapted to respond to signals originated by the senser, and coupling means connecting the senser to the responder. The coupling means has repeatable first and second periods of operation separated in time, and is adapted to assume a state in which it can pass signals from the senser to the responder, said first and second periods being separated by mute periods during which the coupling means is incapable of passing a signal from the senser to the responder.

3,674,141

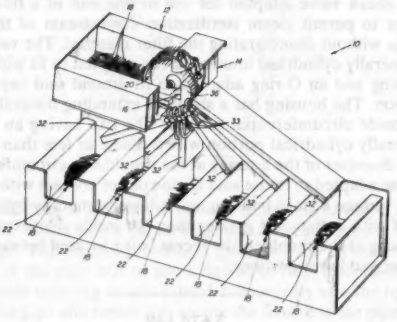
ARTICLE HANDLING WITH FLUID EJECTION

Bruce C. Abraham, Reading; Charles R. Fegley, and George B. Lougher, III, both of Laureldale, all of Pa., assignors to Western Electric Company, Incorporated, New York, N.Y.

Filed Dec. 21, 1970, Ser. No. 100,068

Int. Cl. B07c *3/04*

U.S. Cl. 209—74 **3 Claims**



Articles are sorted into a plurality of categories in accordance with test results. The articles are picked up on the outer surface of a carrier drum at a loading station and are indexed past a testing station. Test results are stored in a memory.

One of a number of separately actuated air ejection nozzles propels an article away from the outer surface of a drum into a desired chute in accordance with test results stored in the memory.

3,674,142

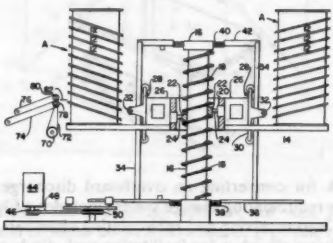
COLLATING AND COLLECTING APPARATUS

Thomas R. Bristol, Redwood City; Harold Lakin, Portola Valley, and Fred L. Renga, Sunnyvale, all of Calif., assignors to Kleer-Vu Industries, Inc., New York, N.Y.

Filed July 28, 1970, Ser. No. 58,938

Int. Cl. B07c *3/02*

U.S. Cl. 209—74 **6 Claims**



Collating and collecting apparatus in which a plurality of receiving bins are arranged in a helical array on a vertically movable platform. The platform is connected to a threaded central column so that rotation of the platform will cause both vertical and circumferential movement.

3,674,143

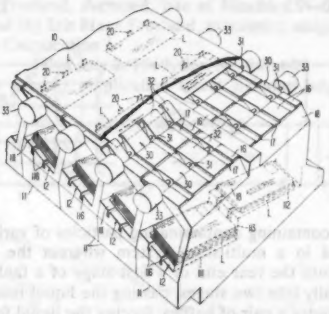
TRANSPORT AND SORTING MECHANISMS FOR AN AUTOMATIC CONVEYOR SYSTEM

James R. Hunter, Chadds Ford; Sebastion James Lazzarotti, Broomall, and Abe Mann, Bala Cynwyd, all of Pa., assignors to Burroughs Corporation, Detroit, Mich.

Filed Dec. 28, 1970, Ser. No. 101,526

Int. Cl. B07c *3/06*

U.S. Cl. 209—74 **5 Claims**



This disclosure relates to a transport and sorting mechanism for an automatic conveyor system for mail pieces and the like wherein the articles to be sorted are moved along a smooth surface by means of a transport belt or linkage having pairs of studs or arms to impart a horizontal motion to the articles. The smooth surface along which the articles are conveyed is formed of the top surfaces of partitions between various destination receptacles and rotatable gates over the respective receptacles which gates when closed are in alignment with the top surfaces of the partitions. Letters and other pieces of mail of various sizes are placed in the conveyor system by the operator who records the destination of each article so inserted and the article is conveyed along the smooth surface until it reaches its destination receptacle at which time the rotatable gate is opened to allow the article to be received by the corresponding receptacle. Two or more receptacles can be served by a single belt or linkage and means are provided to merge the contents of such pairs of receptacles and place them on a separate conveying transport for further processing.

3,674,144

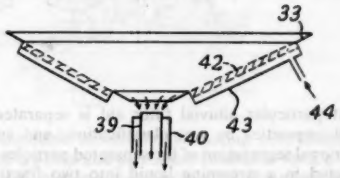
GRAVITY SEPARATION OF GRANULAR MATERIALS

Leslie Dyne Muller; Charles Philip Sayles, both of Stevenage, Hertfordshire, and Richard Henry Mozley, Penzance, Cornwall, all of England, assignors to Warren Spring Laboratory, Gunnels Wood Road, Foundry House, Newlyn, England

Continuation-in-part of Ser. No. 555,383, June 6, 1966, abandoned. This application March 13, 1969, Ser. No. 811,278

Int. Cl. B07b *3/12*

U.S. Cl. 209—468 **2 Claims**



Apparatus for gravity separating dry granular materials has an inclined surface of porous material. To facilitate the flow of

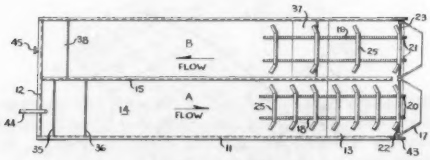
materials down the incline and the sinking of materials of higher specifice gravity or of larger size to the bottom of the stream, a gas is passed through the porous surface to fluidize the granular materials. The surface may take the form of a chute with tapering sidewalls and porous base or a circular funnel-shaped vessel of porous material.

3,674,145

METHOD AND APPARATUS FOR CLARIFYING LIQUIDS

David L. Schmutzler, Marinette, and John H. Schmutzler, Port Washington, both of Wis., assignors to Jadair, Incorporated, Port Washington, Wis.

Filed March 26, 1970, Ser. No. 22,929
Int. Cl. B01d *11/18*
U.S. Cl. 210—73 **13 Claims**



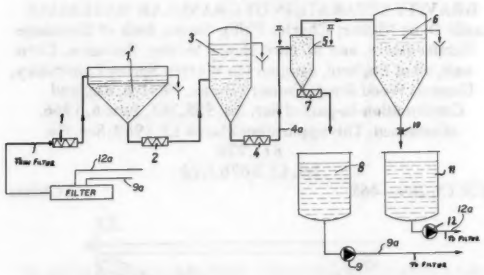
Liquids containing contaminating particles of various sizes are treated in a multi-stage system wherein the liquid is delivered into the rear end of a first stage of a tank divided longitudinally into two stages; passing the liquid into contact with and under a pair of baffles; forcing the liquid forward in the first stage to effect a settling of the coarser particles; slowly conveying the settled particles forward, up and out of the first stage of the tank; passing the liquid from the first stage to the second stage through a crossover weir which skims off the cleanest liquid; continuously forcing the liquid down to the bottom of the second stage and under a baffle, minimizing the settling distance for the finer particles; slowly conveying the settled particles forward, up and out of the second stage; and skimming the cleanest liquid at an outlet baffle located at the rear of the second stage adjacent the inlet of the first stage.

3,674,146

METHOD OF REGENERATING FILTER AIDS

Anton Hoegger, Rapperswil/St. Gallen, Switzerland, assignor to Hans Muller, Maennedorf/Zurich, Switzerland

Filed July 2, 1970, Ser. No. 51,769
Claims priority, application Switzerland, July 9, 1969, 10591/69
Int. Cl. B01d *37/02*
U.S. Cl. 210—73 **8 Claims**



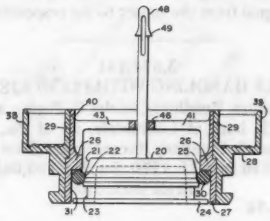
Spent particular alluvial filter aid is separated from entrapped impurities by wet classification, and subsequently gravitational segregation of the separated particles of filter aid is effected in a streaming liquid into two fractions one of which contains finer particles and the other of which contains coarser particles.

3,674,147

CHECK VALVE

Bernard Danti, Lexington, Mass., assignor to Millipore Corporation, Bedford, Mass.

Filed Feb. 8, 1971, Ser. No. 113,185
Int. Cl. B01d *35/18, 35/02*
U.S. Cl. 210—136 **6 Claims**



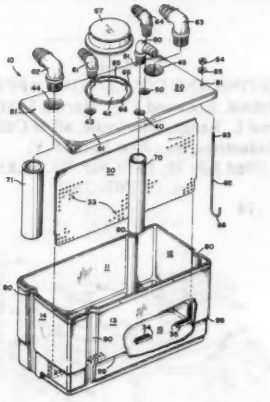
A check valve adapted for use in one end of a filter cartridge to permit steam sterilization downstream of the cartridge without disintegrating the filter material. The valve has a generally cylindrical housing, a cap adapted to fit within the housing and an O-ring adapted to fit around said cap under tension. The housing has a shoulder extending inwardly from its inside circumferential surface. The cap having an upper, generally cylindrical portion with a diameter less than the inside diameter of the housing at the shoulder, a circumferential recess adapted to house said O-ring out of contact with the inside surface of said housing and a lower generally cylindrical shelf with a diameter greater than the inside diameter of the housing at the shoulder, the recess being located between said upper and lower portions.

3,674,148

HEAD CONVERSION UNIT

Merlin S. Miller, Bradford, Ohio, and Ronald D. Russo, Wethersfield, Conn., assignors to Koehler-Dayton, Inc., Dayton, Ohio

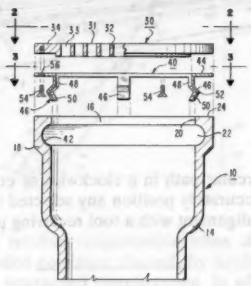
Filed April 15, 1970, Ser. No. 28,602
Int. Cl. B01d *35/02*
U.S. Cl. 210—152 **6 Claims**



A tank for converting an overboard discharge type boat head to a recirculating sewage system includes a filter dividing the tank into receiving and recirculating chambers, a sump in the receiving chamber for facilitating tank discharge, a snap-on cover engaging the upper edges of the tank side walls, a rinsing nozzle for periodically cleaning the filter, and depres-

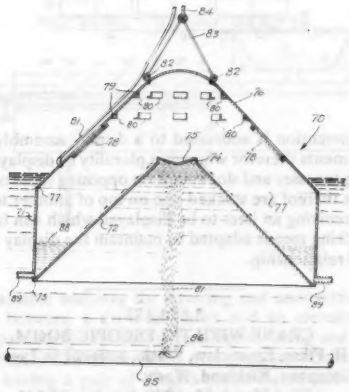
sions formed in the tank side walls to accommodate tie-down bolts which extend from the cover to anchorages on the boat structure. The tank side walls are constructed from a translucent or transparent material so that the liquid level therein may be observed and a shoulder is formed in the side walls to indicate the correct level of priming materials in the tank.

3,674,149
PLUMBING GRATE FIXTURE
Alton E. Donalson, 7919 Twin Hills, Houston, Tex.
Filed Dec. 8, 1970, Ser. No. 96,156
Int. Cl. B01d *35/02*
U.S. Cl. 210—163 **1 Claim**



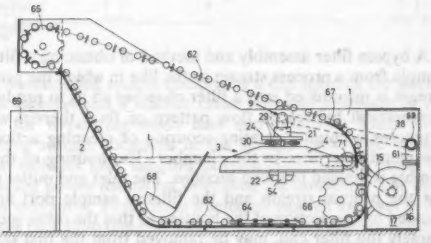
A grate fixture adapted to cover a drainpipe having a bell-mouthed flaring with a planar edge and a circular groove near the edge. The fixture provides a grate portion to cover the mouth of the pipe and to allow liquids to flow therethrough. Releasable securing means extend downwardly into the opening of the pipe and removably secure the fixture to the pipe.

3,674,150
APPARATUS FOR PREVENTING OFFSHORE OIL WELL POLLUTION
Lloyd M. Lejeune, P.O. Box 243, Belle Chasse, La.
Filed Sept. 25, 1970, Ser. No. 75,322
Int. Cl. B01d *23/00*
U.S. Cl. 210—245 **9 Claims**



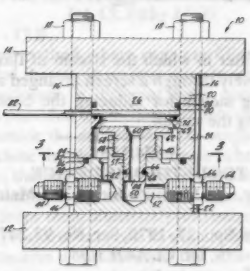
An apparatus for preventing offshore oil well pollution resulting from offshore oil well blowouts or pipe line ruptures. The apparatus includes a sloping cylindrical member having a conical bottom wall open at its upper end. The device is centered over the leak so that the oil passes up into the device through the open top of the conical bottom wall. In the case of a low pressure leak the oil flows down the upper face of the conical wall and is collected in a sump within the apparatus from which it can be pumped. In the case of high pressure blowouts valve plates are provided which can be hydraulically closed to contain the oil spout which then flows into a sump in the apparatus surrounding the conical bottom wall. This sump also may be emptied by pumping. In both instances fire extinguishing gases may be pumped into the device in case ignition of the gas and oil should occur.

3,674,151
BACKFLUSHING FILTER
William Freeland, deceased, late of Hinchley Wood, Surrey, England (by Iris Mary Freeland, executrix), assignor to U.S. Philips Corporation
Filed July 2, 1969, Ser. No. 840,600
Claims priority, application Great Britain, July 2, 1968, 31,560/68
Int. Cl. B01d *29/38*
U.S. Cl. 210—298 **13 Claims**



An apparatus for filtering contaminants from liquid and for cleaning the filter, the apparatus including a filtering screen through which the liquid is drawn in a first direction, and a backflushing nozzle that is moved to various positions adjacent the screen, with clean liquid directed from the nozzle in an opposite direction through the screen to flush off contaminants, and a shroud to aid in removal of contaminants.

3,674,152
REVERSE OSMOSIS TEST CELL
Serop Manjikian, Del Mar, Calif., assignor to Universal Water Corporation, Del Mar, Calif.
Filed Aug. 25, 1970, Ser. No. 66,813
Int. Cl. B01d *35/22, 31/00*
U.S. Cl. 210—321 **5 Claims**



A semipermeable membrane-containing cell, useful when connected to a pump and a pressure control to form a reverse osmosis system, has an adjustable gap through which the feed water flows over the membrane surface. The gap is formed between the membrane surface and the surface of a disk hav-

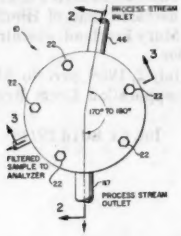
ing a stem screw-thread mounted inside the cell so that rotation of the stem will move the disk surface closer to or farther from the membrane surface. An O-ring seals the disk stem to the cell interior and provides friction to maintain the gap adjustment.

3,674,153

BYPASS FILTER ASSEMBLY AND METHOD OF OBTAINING A FILTERED SAMPLE

Ray J. Gomez, Arcadia, and Kenneth B. Sawa, Yorba Linda, both of Calif., assignors to Beckman Instruments, Inc.

Filed Sept. 25, 1970, Ser. No. 75,355
Int. Cl. B01d *35/22, 31/00*
U.S. Cl. 210—409 **5 Claims**



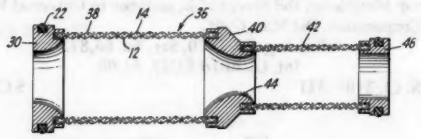
A bypass filter assembly and method of obtaining a filtered sample from a process stream or the like in which the process stream is introduced into a filter chamber so as to produce a symmetrical bifurcated flow pattern of fluid therein which promotes a counter-rotating scouring or cleaning action on the membrane filter in the chamber. The housing of the assembly is divided into two sections. The inlet and outlet ports for the process stream and the filtered sample port are all located in one section of the housing so that the other section, namely the filter cap, may be removed from the first section without disconnecting any flow lines from the cap, thus facilitating rapid removal of the cap and replacement of the filter element therein.

3,674,154

FILTRATION APPARATUS

Marcel Clarence Sicard, Cheshire, Conn., assignor to AMF Incorporated

Filed May 20, 1968, Ser. No. 730,494
Int. Cl. B01d *29/30*
U.S. Cl. 210—456 **1 Claim**



A fluid wash filter in which the stream of fluid is partially diverted transversely through a screen arranged along the axis of flow including means for reducing the concentration of contaminant along the screen.

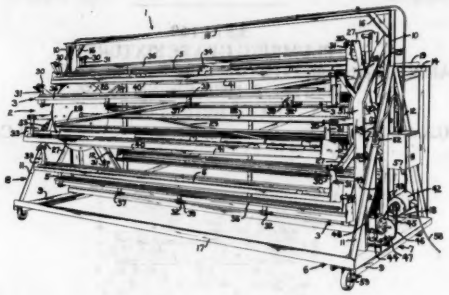
3,674,155

TOOL STORAGE DEVICE

Lester A. Kessler, c/o Metcraft Inc., 1203 Main St., Grandview, Mo.

Filed Nov. 27, 1970, Ser. No. 93,247
Int. Cl. A47f *3/08*
U.S. Cl. 211—1.5 **9 Claims**

A tool storage device for storing and dispensing elongated heavy tools, such as forming dies, blades or the like, for metal working machines, includes a mobile supporting frame having a pair of spaced end frames with an axle extending therebetween and a reel mounted on the axle for supporting a plurality of circumferentially spaced tool supporting trays, holders or the like. Power means are operatively connected to the reel for rotating same to move the trays or holders through



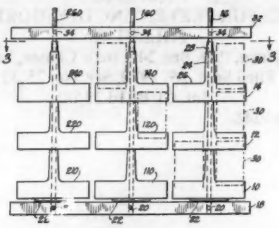
a generally circular path in a clockwise or counterclockwise direction to accurately position any selected one of the trays or holders in alignment with a tool receiving portion of a tool using machine.

3,674,156

DISPLAY ASSEMBLY AND ELEMENT THEREFOR

Jimmie M. Krebs, Chicago, Ill., assignor to Chicago Show Printing Company, Chicago, Ill.

Filed Aug. 14, 1970, Ser. No. 63,693
Int. Cl. E05b *73/00*
U.S. Cl. 211—4 **26 Claims**



This invention is addressed to a display assembly and display elements therefor wherein a plurality of display elements defining recesses and slot means on opposing faces of the base portions thereof are stacked one on top of another to define a space receiving an item to be displayed which can be secured by a locking means adapted to maintain the display items in a stacked relationship.

3,674,157

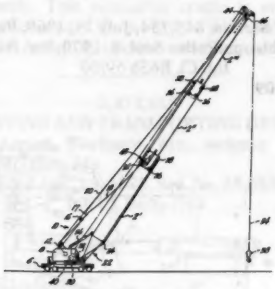
CRANE WITH TELESCOPIC BOOM

Tyman H. Fikse, Enumclaw, Wash., assignor to Tyee Construction Company, Kirkland, Wash.

Filed March 25, 1970, Ser. No. 22,542
Int. Cl. B66c *23/06*
U.S. Cl. 212—55 **12 Claims**

A means and technique are disclosed for latching and unlatching the telescoping boom sections of a crane boom or other outrigger device which is mounted on an anchorage to

be pivoted into an operatively inclined position relative to the horizontal. In the device, there are three elongated boom sections, the intermediate and the uppermost sections of which are relatively reciprocably engaged with one another, and conjointly reciprocably engaged with respect to the lowermost section, to be extended and retracted in relation to one another, and in relation to the lowermost section, along the length of the device while it is in the operatively inclined position thereof. The intermediate and uppermost sections are



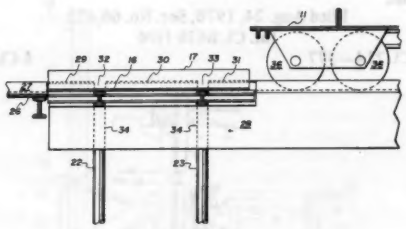
latched against relative reciprocation when they are in the relatively extended condition thereof, by latch means which are operatively interposed therebetween. In addition, the intermediate and uppermost sections are maintained in relatively extended condition with respect to the lowermost section, and released for relative retraction, by means including a latch release member which is mounted on the lowermost section and operative to release the latch means between the intermediate and uppermost sections when the latter sections have travelled a predetermined distance in relation to the lowermost section.

3,674,158

PALLET TYPE PARKING SYSTEM WITH A RETRACTABLE WALKWAY

Calvin P. Owen, 5820 Hazeltine 21, Van Nuys, Calif.

Filed Dec. 24, 1970, Ser. No. 101,205
Int. Cl. E04h *6/06*
U.S. Cl. 214—16.1 CE **3 Claims**



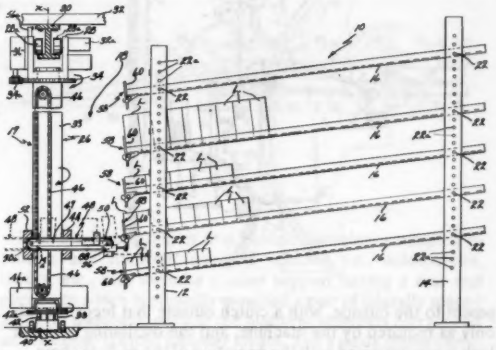
A retractable walkway for covering and uncovering roller channels between a drive-on pallet and an elevator in an elevator parking system during passenger loading and unloading which is carried on vertically driven support columns; the walkway having a pair of hinged panes for revealing roller tracks located beneath the walkway in its elevated position to allow a pallet to be transferred on and off an elevator when passengers are not loading and unloading and to cover the roller tracks when the walkway is in an elevated position giving passengers a smoothly surfaced walkway during their loading and unloading.

3,674,159

LOAD HANDLING MECHANISM AND AUTOMATIC STORAGE SYSTEM

Jerome H. Lemelson, Metuchen, N.J., assignor to The Triax Company, Cleveland, Ohio

Filed March 7, 1969, Ser. No. 805,315
Int. Cl. B65g *1/06*
U.S. Cl. 214—16.4 A **14 Claims**



A warehousing system comprising a storage rack for storing loads thereon and a stacker crane movable alongside of the rack for depositing loads into and removing loads from selected storage locations in the storage rack. The stacker crane includes load handling portion comprising a conveyor including power means for operating the conveyor. The conveyor may move a load from a selected storage location in the storage rack onto one end thereof and then by powered operation of the conveyor, the load can be moved lengthwise of the load handling portion to a storage position on the latter, and then the conveyor can operate to pickup another load from a selected storage location and move it along the load handling portion and so on. In certain embodiments, transfer means coact between the load handling portion and the storage rack for aiding in transferring loads between the latter. Certain embodiments also include a powered load manipulator mechanism for transferring a load between the load handling portion and the storage rack.

3,674,160

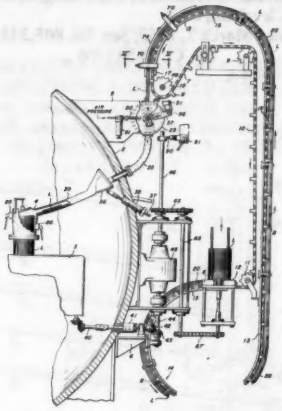
APPARATUS FOR TRANSFERRING CAN LIDS THROUGH A PARTITION SUBJECT TO A PRESSURE DIFFERENTIAL

Chester L. Gutowski, Pittsburgh, Pa., assignor to H. J. Heinz Company, Pittsburgh, Pa.

Filed April 8, 1971, Ser. No. 132,509
Int. Cl. B65g *37/00*
U.S. Cl. 214—17 B **13 Claims**

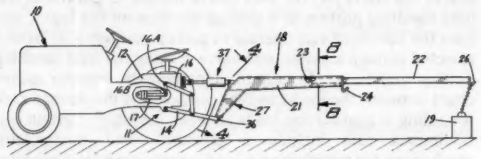
In a canning method where cans are filled with a product and a lid sealed thereto in an enclosure in which the pressure inside the enclosure is different from pressure outside, a mechanism is provided for feeding can lids one at a time from a magazine outside the enclosure to the magazine of a can lid-applying machine inside the enclosure wherein an endless chain removes the lids from the bottom of a magazine outside the holder, carries them around a looped guide, one after another, and drops them alternately into one of two pockets in an oscillating pressure lock, one of which pockets is open only at the top to receive a can lid when the other has moved to a position where it is open only at the bottom to discharge a lid into a gravity chute that passes through the enclosure wall to the magazine of the can lid-applying machine inside the enclosure. The trap then oscillates to open the now-empty pocket at the top to receive a lid and close the other pocket at the top and open it at the bottom to discharge the lid which it

received. The lid-feeding mechanism is driven from the can lid-applying machine inside the enclosure through a shaft that



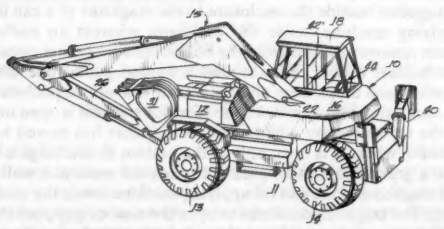
passes to the outside, with a clutch outside that feeds the lids only as required by the machine, and the oscillating pressure lock is synchronized with the operation of the endless chain.

3,674,161
LIFT BOOM ASSEMBLY
Jon W. Grinde, Moorhead, Minn., assignor to King Company, Inc., Fargo, N. Dak.
Filed April 6, 1970, Ser. No. 25,649
Int. Cl. B66c *23/00*
U.S. Cl. 214—130 R **7 Claims**



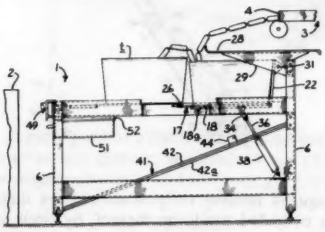
A lift boom assembly mounted on the draft links of a three-point hitch on a tractor. A power control cylinder, connected to the tractor and on an upper portion of the base of the boom, pivots the boom on the draft links of the hitch to raise and lower the boom. The boom has a first rearwardly directed member holding a second removable member.

3,674,162
ROUGH TERRAIN VEHICLE
Robert M. Smith, Grayslake, Ill., assignor to The Hy-Dynamic Co., Lake Bluff, Ill.
Filed Dec. 21, 1970, Ser. No. 100,210
Int. Cl. E02f *3/74*
U.S. Cl. 214—138 R **4 Claims**



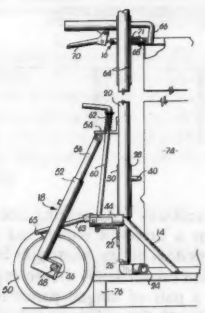
A rough terrain vehicle such as a crane or backhoe which has a turntable mounted boom, the turntable also carrying a cab on one side of the boom and hydraulic valving means on the other side of the boom, the cab being equipped with sets of controls at each end and a reversible seat in-between so that the operator can face the proper direction for driving or material handling, irrespective of the disposition of the boom.

3,674,163
LOADING TABLE FOR USE WITH CONTINUOUS PRODUCTION OF WIENERS
William H. Neubeck, Jr., Justice, Ill., assignor to Bloomer-Fiske, Inc.
Division of Ser. No. 845,734, July 29, 1969, Pat. No. 3,606,956. This application Sept. 8, 1970, Ser. No. 69,897
Int. Cl. B65b *69/00*
U.S. Cl. 214—309 **3 Claims**



In an apparatus for continuous production of wieners, a loading table supports tubs for delivering strands of uncooked wieners to the intake of the processor. The table has a top with a series of bays or sections each for supporting tubs containing strands of wieners, one of the tubs of each bay being supported on a trap door portion of the top and serving to supply the processor. The stands in the tubs are joined so that when the tub on the trap door portion of each bay has emptied, the delivery to the processor proceeds from the adjacent tub. However, the trap door portion in each bay can be operated to lower the empty tub thereon to a slide below the table that returns the empty tub to the front of the table for reuse. When the trap door is returned, it provides a support for receiving the aforesaid adjacent tub.

3,674,164
HAND TRUCK FOR OIL DRUMS AND THE LIKE
Jonas J. Kaufman, Section #12, VA Center, Wadsworth, Kans.
Filed Aug. 24, 1970, Ser. No. 66,473
Int. Cl. B62b *1/06*
U.S. Cl. 214—377 **6 Claims**



A hand truck for moving barrels or the like to and from an elevated platform utilizes a swingably mounted wheel and axle assembly which permits positioning of the barrel-supporting frame of the truck on the platform while the wheels remain on the ground. The wheel and axle assembly is also provided with an extensible connection with the frame which is operable

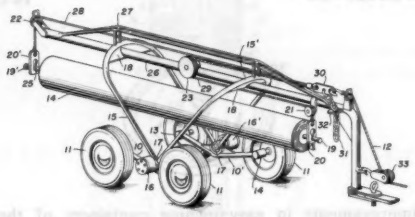
concurrently with swinging of the axle to assure that the wheels remain in engagement with the ground, regardless of the weight of the elevated platform. A pair of free-swinging arms which extend forwardly of the hand truck frame are positionable beneath a barrel to support the latter while a gripping hook spaced from the arms engages the upper end of the barrel to allow tilting thereof in the direction of the hand truck. A cradle support on the frame of the hand truck opposite the wheel and axle assembly is mounted for extensible movement from a retracted position to an extended position to facilitate placement thereof on the elevated platform forwardly of the assembly wheels. This extensible cradle is movable to its retracted position under the weight of the hand truck as the latter is raised to an upright position on the platform.

3,674,165

HOISTING AND TRANSPORTING DEVICE

Kearney D. Arrant, Florissant, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Aug. 19, 1970, Ser. No. 65,065
Int. Cl. B60p *1/64*
U.S. Cl. 214—396 **1 Claim**



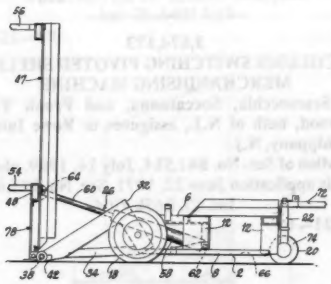
An apparatus is herein described for hoisting and transporting rolled carpet, especially long cylindrical rolls of substantial weight and size.

3,674,166

MATERIAL TRANSPORTING APPARATUS

Glenn G. Dunbar, Toledo, Ohio, assignor to Allied Tube and Conduit Corporation, Harvey, Ill.

Filed June 29, 1970, Ser. No. 50,423
Int. Cl. B60p *1/04*
U.S. Cl. 214—501 **5 Claims**



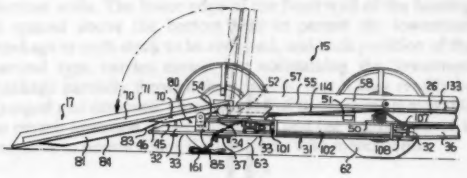
This application discloses a wheeled cart comprising a frame on which is mounted a motor connected by transmission means to wheels at one end of the cart to propel it. A frame extension is pivotally mounted at one end of the frame and has a bed pivotally mounted thereon at its end opposite from its pivotal connection to the frame. A piston and cylinder actuator is pivotally mounted between the bed and the frame to cause the frame extension to pivot toward a supporting surface and when it has reached the limit of its movement to cause the bed to move toward a vertical position.

3,674,167

VEHICLE AMBULANCE

Bissett J. Roberts, Box 351, Waynesboro, Pa.

Filed Sept. 4, 1970, Ser. No. 69,779
Int. Cl. B60p *3/12, 1/30*
U.S. Cl. 214—505 **14 Claims**



This disclosure relates to a vehicle ambulance adapted to receive and transport disabled vehicles, i.e., automobiles, trucks, etc., and includes a main support having a rear end portion to which is pivotally mounted a pair of laterally spaced platform members, each of the platform members carrying on an underside thereof follower means, and a guide frame carrying a pair of actuators associated with each follower for moving the platform members between an outwardly and downwardly inclined first position relative to the main support and an outwardly and generally parallel second position relative to the main support.

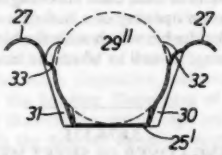
The vehicle ambulance further includes means for supporting the platform members in a third generally upright vertical position, and means are provided for mounting a light assembly to the platform members in both the first and third positions thereof. The actuator means are moved in unison by means of an extensible-retractable fluid motor with the latter being articulately mounted between the main vehicle support and the laterally supported guide frame carrying the actuator means.

3,674,168

CUPPED TRAYS MADE FROM A THIN SHEET OF PLASTICS MATERIAL FOR ROUND OR PEAR-SHAPED FRUITS OR HORTICULTURAL PRODUCTS

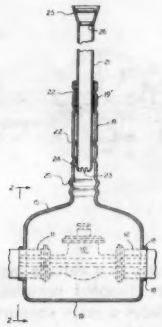
Pietro Padovani, Verona, Italy, assignor to I.S.A.P. SpA, Verona, Italy

Filed July 8, 1970, Ser. No. 53,264
Claims priority, application Italy, July 11, 1969, 61254 A/69
Int. Cl. B65d *85/34*
U.S. Cl. 217—26.5 **6 Claims**



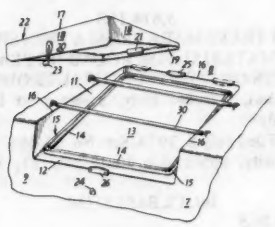
Fruit tray made from thin plastics sheet has recesses with integral wall and floor. Part of the wall of each recess is bulged inwardly so that part of the bulge forms an anchoring element for the fruit. This element is located in the region of the mid-height of the fruit concerned and the lower part of the bulge is deformed outwardly by the fruit when inserted. The element then holds the fruit against the recess bottom.

3,674,169
VALVE BOXES
John H. Miller, 1031 N. 14th St., Manitowoc, Wis.
Filed Sept. 22, 1970, Ser. No. 74,375
Int. Cl. B65d 7/24, 11/18
U.S. Cl. 220—4 R **4 Claims**



An underground valve housing made of waterproof and insulating material is sealed around a valve in a pipe. The housing has an air shaft which rises to the surface of the ground to vent any escaping gas and to give ready access to the valve in case it must be closed under emergency conditions.

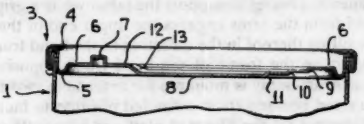
3,674,170
STORAGE CONTAINERS FOR USE IN MARINE CRAFT
David C. Thorpe, London, England, and Richmond Marine Limited, London, England
Filed Dec. 22, 1969, Ser. No. 887,295
Claims priority, application Great Britain, Jan. 3, 1969, 4,209/69
Int. Cl. B65d 25/24
U.S. Cl. 220—18 **5 Claims**



The invention deals generally with container structures and concerns containers or bins, each bin being insertable in a wall opening, such as an opening of a hull of a marine craft, and having a cover for the bin which seals the bin when in position in the hull opening, as well as when the bin is removed from the same.

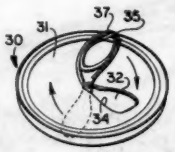
3,674,171
FULLY OPENING COVER OF SHEET METAL FOR CANS
Hans Joachim Fahlbusch, Vechelde, Germany, assignor to Schmalbach-Lubeca-Werke Aktiengesellschaft
Filed Dec. 7, 1970, Ser. No. 95,551
Claims priority, application Germany, Dec. 8, 1969, G 69 47 543.0
Int. Cl. B65d 17/24
U.S. Cl. 220—54 **7 Claims**

This disclosure relates to a full opening easy opening closure which has an end panel with a graduated spring profile which facilitates expansion and contraction as may occur during the sterilization of a product within a closed container. In order that this spring profile may have no undesirable action which may cause premature opening of the container, the end



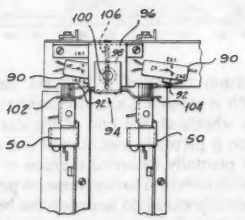
panel is provided with a shock absorbing bead adjacent the chuck wall and the pull tab is mounted on a platform which extends radially into the spring profile areas, but is not affected thereby.

3,674,172
EASY-OPENING CONTAINERS
Robert A. Wells, and Carl J. Strobe, both of Atlanta, Ga., assignors to SMW Atlanta, Inc., Atlanta, Ga.
Filed Nov. 2, 1971, Ser. No. 194,895
Int. Cl. B65d 17/24
U.S. Cl. 220—54 **16 Claims**



Improvements in easy-opening containers of the type frequently referred to as "pop-top" containers used for beverages and other substances. The portion of the easy-opening container which is removed upon opening of the container, and which typically includes a tab of material torn or otherwise removed from the container and a pull ring attached to the tab and having a finger pull therein, is provided with container engagement structure which enables the ring to be secured to the container with the torn-out tab inserted through the opening in the opened container. The finger pull in the ring partially or completely surrounds the opening in the container, thus shielding the sides of the container opening from possible damage to the lips or tongue of a person drinking from the container and also providing a convenient, nonlittering technique for disposal of the torn-out portion.

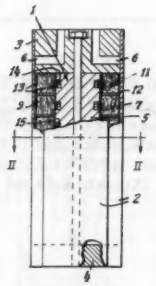
3,674,173
COLUMN SWITCHING PIVOTED SHELF MERCHANDISING MACHINE
Gregory Scarnecchia, Succasunna, and Frank T. Scalera, Maplewood, both of N.J., assignors to Rowe International Inc., Whippany, N.J.
Continuation of Ser. No. 841,514, July 14, 1969, abandoned.
This application June 22, 1971, Ser. No. 155,637
Int. Cl. B65h 7/04
U.S. Cl. 221—6 **12 Claims**



A column-switching, pivoted-shelf merchandising machine of the type in which respective travellers associated with

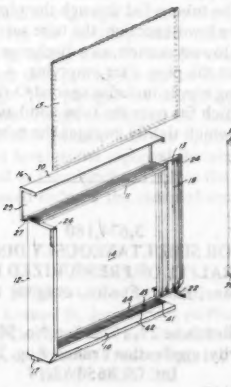
columns of normally erected pivoted shelves sequentially release the shelves as they move upwardly in response to operation of their associated actuating mechanisms. We provide means for initially disabling one of the mechanisms and for enabling the other mechanism in response to actuation of a common push button or the like. This means is responsive to arrival of the one traveller at the top of its column for concomitantly disabling the one mechanism and enabling the other mechanism and responsive to the presence of both travellers at the top of the columns for disabling both mechanisms and for giving an empty signal.

3,674,174
AIRBORNE DISPENSER
John Mervyn Crewe, Horsham, England, assignor to Smith & Wesson Chemical Company, Inc.
Filed June 12, 1970, Ser. No. 45,843
Int. Cl. B65d *83/00*
U.S. Cl. 221—87 **1 Claim**



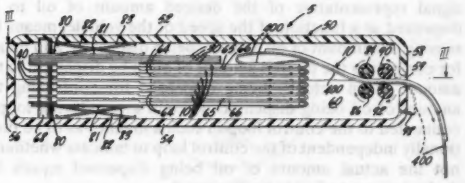
An improved airborne dispenser for releasing radar reflective material, pyrotechnic flares and the like includes a core member for storage of the material to be released and a protective casing which is removed in flight to allow for optimum dispersion of the material released.

3,674,175
MULTIPLE SIZE PACKAGE DISPLAY AND DISPENSER
John Jaquish, Brooklyn, N.Y., assignor to Trans-World Display Corporation
Filed Nov. 12, 1970, Ser. No. 88,843
Int. Cl. A47f *5/10*
U.S. Cl. 221—92 **11 Claims**



The display and dispenser includes a housing having two types of interior partitions. The first type are individually adjustable along the length of the top and bottom walls of the housing to vary the width of chambers within the housing which will accommodate stacks of merchandise packages. The second type are individually adjustable across the width of the top and bottom walls to vary the depth of the chambers. One partition of each type may be arranged as a unit having an L-shaped cross section, each such unit being slidable along any of a series of parallel guides carried by the housing top and bottom walls. The lower edge of the front wall of the housing is spaced above the bottom wall to permit the lowermost package in each stack to be removed, and each partition of the second type carries means for maintaining the lowermost package partially through the space so that it may readily be grasped and removed. One side wall of the housing is movable to permit insertion of the partitions, and the housing cover is movable to permit filling the chambers with merchandise.

3,674,176
DEVICE FOR HOLDING AND DISPENSING THERMOMETERS
Zsigmond Sagi, Parsippany, N.J., assignor to Bio-Medical Sciences, Inc., Fairfield, N.J.
Filed March 4, 1971, Ser. No. 120,997
Int. Cl. A24f *27/14*
U.S. Cl. 221—135 **22 Claims**

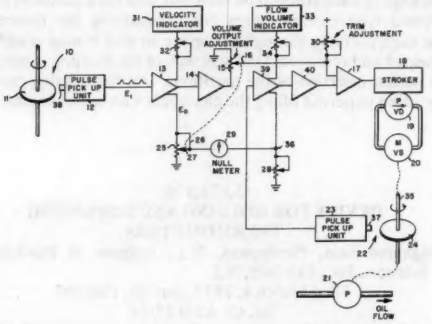


A package for use with disposable thermometers of the type having a thermally sensitive substance on a thermally conductive sheet and an overlying transparent film carrying indicator means which are superpositionably registrable with the thermally responsive substance to denote temperature change upon change of state in the substance, which thermometer normally is provided with a removable shield interposed between the substance and the indicator means to prevent communication between the two until the thermometer is ready for use. The thermometers are disposed along and removably attached to a carrier tape which together as a unit are received in a housing with the thermometers arranged in a superposed stack and the carrier tape folded in a series of accordion pleat-like folds with each accordion pleat-like fold interleaved between adjacent ones of the thermometers and an end of the tape extending through an opening in the housing. Pull tab means on the shield of each thermometer are arranged in a similar stack disposition and are secured to an anchorage within the housing. Dispensing of the thermometers is effected by drawing the carrier tape and attached thermometers through the housing opening, such withdrawal of the carrier tape and each thermometer attached thereto being effective to initiate peeling away of the shield from the thermometer within the housing. The housing also includes means therein adjacent the opening thereof which applies during dispensing a wiping or pressing force to the transparent film on which is carried the indicator means to reseal the thermometers and press the transparent film into contact with the carrier sheet positioning the indicator means in proper overlying communicating registration with the temperature responsive substance on the carrier sheet.

3,674,177
INDICATING MEANS FOR AN AUTOMATIC DISPENSER CONTROL SYSTEM

Royal R. Hawkins, Bloomington, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 7, 1970, Ser. No. 78,701
Int. Cl. B67d 5/08
U.S. Cl. 222—52 18 Claims

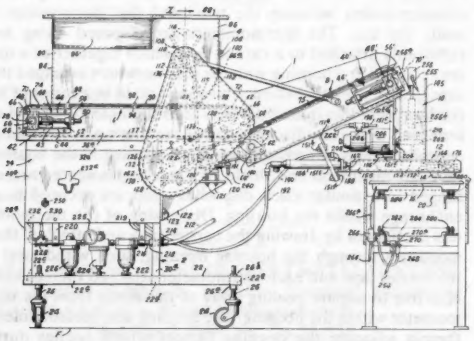


Apparatus for controlling the rate at which oil is dispensed from a moving vehicle embodying a control loop having a means for sensing the speed of the vehicle and for providing a signal representative of the desired amount of oil to be dispensed as a function of the speed of the vehicle, means for sensing the amount of oil actually being dispensed, and means for comparing the desired amount of oil to be dispensed to the amount of oil actually being dispensed for controlling the amount of oil being dispensed wherein a monitoring loop is connected to the control loop in such a manner as to be functionally independent of the control loop to indicate whether or not the actual amount of oil being dispensed equals the desired amount of oil to be dispensed.

3,674,178
APPARATUS FOR MEASURING AND DISPENSING PARTICULATE MATERIAL

Johnny B. Pomara, Jr., 1925 Valley View Lane, Dallas, Tex.

Filed Dec. 17, 1969, Ser. No. 885,872
Int. Cl. B67d 5/08
U.S. Cl. 222—56 25 Claims

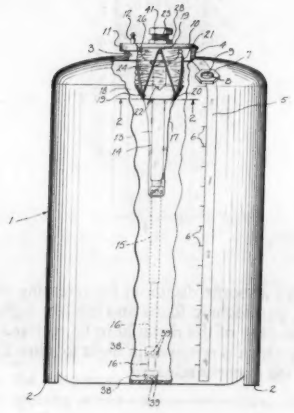


Apparatus for measuring and dispensing moistened or dry particulate material, such as rice or grated cheese, comprising a storage container having an agitator therein for dispensing and uniformly spreading particles of material on a conveyor which feeds the material into a measuring and dispensing device. The measuring and dispensing device comprises a container having an inclined bottom with an agitator disposed therein and a vibrator connected thereto to allow unpacked particles to be measured and dispensed into receptacles in food trays. The apparatus which measures and dispenses the material comprises a slide having a measuring compartment with a variable volume which moves under the container for filling and then over a hollow dispensing spout which is congruent with the receptacle in the tray to fill the receptacle.

3,674,179
TELESCOPING DIP TUBE ASSEMBLY

Edwin J. Galloway, Menasha, Wis., assignor to Galloway Company, Neenah, Wis.

Filed April 1, 1971, Ser. No. 130,364
Int. Cl. B65d 35/22
U.S. Cl. 222—94 11 Claims



A dip tube assembly for a liquid storage tank includes a telescoping fill pipe and a flexible discharge tube. As delivered, the pipe is telescoped and a vacuumized liner bag is collapsed about it and held in place by a resiliently suspended collar. Liquid introduced through the pipe causes the bag to feed through the collar and the pipe extends, but a stop prevents the lowest section from extending fully until it is manipulated. The tube is fed through the pipe after filling and connected to the lowest section, the tube serving as a means to manipulate the lowest section, as a discharge conduit, and as a means to retract the pipe after emptying. A seal between the tube and a fitting nipple includes spaced O-rings on the nipple and a sleeve which fits over the tube and has an inner circumferential ridge which tightly engages the tube between the O-rings.

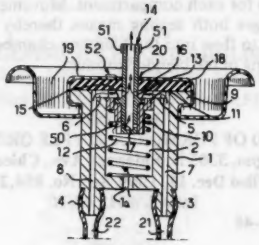
3,674,180
VALVE FOR SIMULTANEOUSLY DISPENSING A PLURALITY OF PRESSURIZED FLUIDS

Bruno P. Morane, Paris, France, assignor to L'Oreal, Paris, France

Filed June 29, 1970, Ser. No. 50,718
Claims priority, application France, Aug. 7, 1969, 6927143
Int. Cl. B65d 83/14
U.S. Cl. 222—145 3 Claims

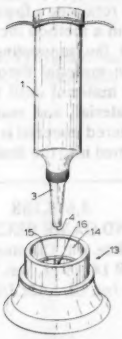
Valve for simultaneously dispensing a plurality of fluids under pressure is adapted to be set to a position permitting a

purge of pressurizing gas to be passed therethrough without any fluid to be dispensed, another position in which gas is



passed through the valve along with the fluids to be dispensed, and yet another position in which only fluids to be dispensed may pass through the valve.

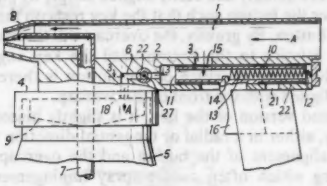
3,674,181
SYRINGE AND HOLDER
Joseph D. Marks, 4252 N. 74th St., Milwaukee, Wis.; Norman G. Le Beck, 7434 N. 52nd St., Milwaukee, Wis., and Glenn L. Allen, W283 N2191 Beach Road, Pewaukee, Wis.
Filed Jan. 23, 1970, Ser. No. 5,227
Int. Cl. A61m *5/22*
U.S. Cl. 222—179.5 **2 Claims**



A syringe is provided with a vertical support having a stem closing the nozzle of the syringe whereby the cylindrical barrel of the syringe may be partially filled with the impression material such as an epoxy resin formed by constituents added separately through the open upper end of the body and mixed within the syringe. The plunger for the syringe has a minute vent opening therethrough permitting the escape of air as the plunger is forced downwardly into the upper end of the syringe barrel to the level of the material therein. The syringe is thereafter applied to the object to receive the impression and the plunger actuated to force the material through the nozzle into the object.

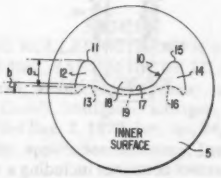
3,674,182
SPRAY-GUN CONTROL
Andre Roche, 35 Avenue St. Jerome, Aix en Provence, France
Filed Oct. 10, 1969, Ser. No. 865,414
Claims priority, application France, Oct. 14, 1968, 22408
Int. Cl. B05b *7/32*
U.S. Cl. 222—193 **1 Claim**

A spray gun has a barrel for connection to a supply of pressurized air and a duct communicating with a reservoir for the material to be sprayed, a flow control valve being provided between the barrel and the duct and including a sleeve valve which, in a first end position determined by a return spring,



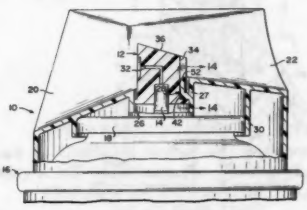
opens the reservoir to atmosphere, and in a second position determined by pull on a trigger provides a flow of air from the barrel into the reservoir.

3,674,183
DISPENSING DEVICE
Herny B. Venable, and Catherine M. Venable, both of Box 144, Chadds Ford, Pa.
Filed Feb. 1, 1971, Ser. No. 111,544
Int. Cl. B65d *37/00*
U.S. Cl. 222—212 **5 Claims**



A dispersing valve comprises a disc having a sinuous slit which is cut at an angle with respect to the face of the disc to form at least two, and preferably three, valve members, one of which is larger than the other one or two and is designed to permit passage of fluid when the container to which the valve is attached is compressed. The at least one other valve permits excess fluid and air to return to the interior of the container when it is released. The multiple valve arrangement is formed by the angular nature of the slit, permitting highly efficient dispensing and resealing action.

3,674,184
SELF-ALIGNING AEROSOL OVERCAP AND BUTTON
Ronald F. Ewald, 2700 Cardinal Drive, Rolling Meadows, Ill.
Continuation-in-part of Ser. No. 856,764, Sept. 10, 1969, abandoned. This application Sept. 16, 1970, Ser. No. 72,656
Int. Cl. B65d *83/00*
U.S. Cl. 222—402.13 **5 Claims**

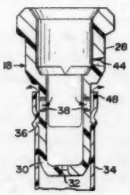


A self-aligning aerosol overcap and button and method of assembling them wherein the overcap includes a key project-

ing within its central button-receiving opening, and the button includes a smooth surfaces top having a downward slant from front to rear of approximately 10° to 20° and a vertical keyway in its side wall for receiving the key of the cap. The overcap and button are quickly and easily aligned simply by placing the overcap over the button such that the key rests on the top surface of the button. By gravity, the overcap will thereafter slide and rotate relative to the button until the key engages the keyway. The terminal orifice of the button is thereby automatically aligned with the front of the overcap.

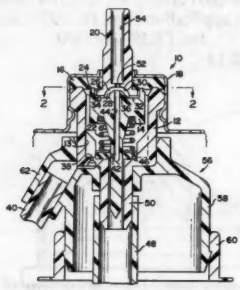
In a refined version of the key, it is slightly biased against the keyway, either in a radial or tangential direction to insure maximum alignment of the button and the overcap with no side twisting which often causes spray impingement under normal use.

3,674,185
AEROSOL VALVE WITH FILLING MEANS
Roger A. Evesque, Cary, Ill., assignor to Seaquist Valve Company, Division of Pittway Corporation, Cary, Ill.
Filed Aug. 24, 1970, Ser. No. 66,387
Int. Cl. B67d 3/18
U.S. Cl. 222—402.16 **1 Claim**



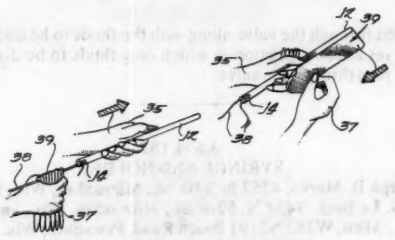
A valve for an aerosol container including a valve body having a number of fill orifices through which propellant and product may be more easily and more rapidly pressure filled. The fill orifices are arranged on the valve body in spaced relation to the customary dispensing on the valve body. Locking means may be fixedly or detachably mounted on the valve body in a predetermined spaced relation to the fill orifices in order to secure the customary dip tube thereto.

3,674,186
CO-DISPENSING VALVE
Ronald F. Ewald, Rolling Meadows, Ill., assignor to Seaquist Valve Company, Division of Pittway Corporation, Cary, Ill.
Filed Nov. 23, 1970, Ser. No. 91,825
Int. Cl. B65d 83/14
U.S. Cl. 222—402.21 **9 Claims**



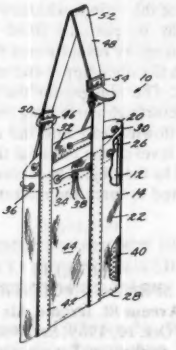
A co-dispensing valve capable of dispensing a blended product formed of two compositions, maintained in two separate compartments. Blending occurs immediately prior to dispensing within a blending chamber by means of a swirl chamber formed between the valve stem sealer and the lower end of the valve stem. Each composition flows to the blending chamber through separate metering orifices and then past sealing means for each compartment. Movement of the valve stem disengages both sealing means thereby allowing both compositions to flow into the blending chamber immediately prior dispensing of the blended product.

3,674,187
METHOD OF FORMING A RUFFLE OR THE LIKE
Dolores Cotugno, 3305 N. Ridgeway Ave., Chicago, Ill.
Filed Dec. 11, 1969, Ser. No. 884,273
Int. Cl. A41h 43/00
U.S. Cl. 223—46 **2 Claims**



A device for making ruffles, tufts, pompons or the like from such materials as cloth net, crepe paper, or tissue. The device has means adapted to be grasped by hand, means for supporting said material on which the material may be gathered, and means for temporarily retaining a fastening means. The device is adapted to be used in a method including the steps of placing the material over the supporting means of the device, gathering together the material thereon, passing the device through the gathered material until the fastening means extends through the material, and manipulating the fastening means so that the gathered material is held in its gathered condition and may be formed into the desired ruffle or the like.

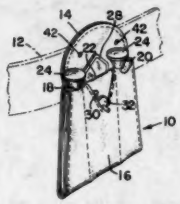
3,674,188
FISH AND GAME RECEPTACLE
Charles C. Anderson, Rte. #1, Quinton, Okla.
Filed April 14, 1971, Ser. No. 134,002
Int. Cl. A45f 3/02
U.S. Cl. 224—5 G **12 Claims**



A fish and game receptacle including an outer water-pervious sack, such as a burlap sack, and, within the sack, a water-impervious liner bag, such as a plastic bag, in which approxi-

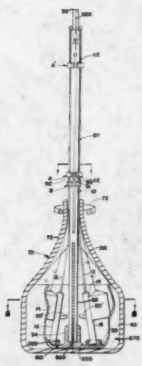
mately the bottom half portion of the liner bag on one side has perforations to permit water or blood to drain from the receptacle while minimizing dehydration of the contents of the receptacle.

3,674,189
GOLFING ACCESSORIES HOLDER
Maude E. Walbeck, 1206 Teneighth Way, Sacramento, Calif.
Filed Nov. 16, 1970, Ser. No. 89,558
Int. Cl. A45c *11/00*
U.S. Cl. 224—5 C **2 Claims**



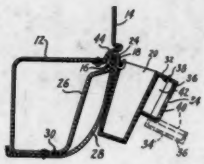
A kit comprised of accessories useable by a golfer and a holder adapted to be worn on clothing or shoes where it can be conveniently accessible as well as decorative. The holder, made from components of flexible, sheet material, is held together in such a manner as to form pockets for golf tees, a ball marker and a greens repair tool.

3,674,190
CARRIER FOR RODS WITH REELS ATTACHED
George R. Wright, 508 First National Bank Bldg., Lincoln, Nebr.
Filed Aug. 6, 1969, Ser. No. 847,949
Int. Cl. A45f *5/00*
U.S. Cl. 224—5 E **8 Claims**



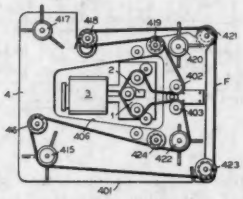
A carrier for fishing rods with reels attached having an elongated member, a reel protecting means extending transversely of and substantially beyond at least two sides of the elongated member and disposed adjacent one end of the elongated member so as to protect at least two rods held against the two sides, means holding the rods to the elongated member, and a removable covering means covering said handles and reels, means holding the rods in spaced positions on the elongated member, a handle attached to a side of said covering means, the handle being a flexible strap of sufficient length to extend over the shoulder of a man of average height while the elongated member is adjacent his hip, the strap being of adjustable length.

3,674,191
REFUSE AND TISSUE HOLDER
Harford E. Goings, 5428 Center Drive, Camp Springs, Md.
Filed Sept. 4, 1970, Ser. No. 69,784
Int. Cl. B60r *7/06*
U.S. Cl. 224—29 R **1 Claim**



A spring clip securing a refuse holder to the front of a vehicle glove compartment and a tissue holder secured and detachably mounted in the alternative to the front of the refuse holder.

3,674,192
FILM-DRIVING ROLLER WITH DEVICE FOR STOPPING THE DRIVE MECHANISM IF THE FILM IS BROKEN
Gernot Gottschall, Boblingen, Germany, assignor to Firma Franz Morat GmbH, Stuttgart-Vaihingen, Germany
Filed Dec. 2, 1970, Ser. No. 94,303
Claims priority, application Germany, Jan. 8, 1970, P 20 00 613.7
Int. Cl. B65h *25/32*
U.S. Cl. 226—11 **9 Claims**

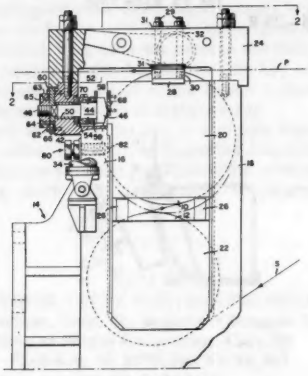


In an optical-electronic scanning device wherein a control film is passed by film driving means and a film cassette, a means for stopping the device when the film breaks.

3,674,193
STRIP TENSION SENSING DEVICE
Raymond E. Robinson, Baden, Pa., assignor to Blaw-Knox Foundry & Mill Machinery, Inc., Pittsburgh, Pa.
Filed April 29, 1971, Ser. No. 138,609
Int. Cl. B65h *23/00*
U.S. Cl. 226—100 **10 Claims**

A device for sensing the tension of a strip of material being fed to or from a rolling mill or the like through a bridle-type

roll assembly wherein a load cell is positioned adjacent the supporting chocks for one of the rolls of the bridle roll assembly so that the tension forces on the strip urge the chock against the load cell.



3,674,194

DRAWING PRESS

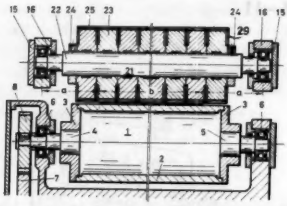
Wilhelm Moesser, Darmstadt, Germany, assignor to Otto C. Strecker K.C., Darmstadt-Eberstadt and Maschinenfabrik zum Bruderhaus G.m.b.H., Reutlinger, Wuerttemberg, Germany

Filed Nov. 13, 1969, Ser. No. 876,449

Claims priority, application Germany, Nov. 27, 1968, P 18 11 203.3

Int. Cl. B65h *17/20*

U.S. Cl. 226—187 **10 Claims**



A drawing press adapted to feed a web of sheet material between a pair of rolls including a first relatively rigid roll extending generally transversely of the path of said web. A second relatively elastic roll urges the web against the first roll and comprises an elongated shaft of elastic material and a plurality of separate, generally cylindrical, disclike weight elements mounted on said shaft in side-by-side relation, each weight element acting by its own deadweight to press said web against said first roll.

3,674,195

FILLED AND SEALED EASILY OPENED BAG AND METHOD OF MAKING SAME

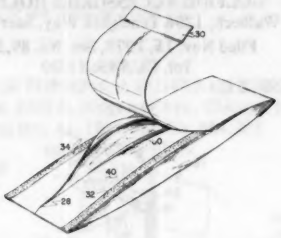
Ralph K. Stone, Longmeadow, Mass., assignor to United States Envelope Company, Springfield, Mass.

Filed Nov. 24, 1970, Ser. No. 92,397

Int. Cl. B65d *33/00*

U.S. Cl. 229—66 **10 Claims**

A filled and sealed bag made of paper or similar flexible sheet material, and particularly well adapted for containing a sterile article, includes a front panel defining one wall of a pocket for containing the article. This front panel contains a relatively long slit covered by a closure strip which may be peelably removed from the bag to expose the slit and to allow the article to be removed from the bag, the adhesive used to hold the closure strip to the front panel being spaced a considerable distance from the edges of the slit so as to avoid the possibility of contaminating the enclosed object. The bag is made and filled by a process which includes slitting a web of sheet material along its length, applying and securing a closure strip to the slit web to rejoin the severed portions of the web and then forming bags from the web by folding and sealing individual pieces of the web which individual pieces are cut from the web to separate the individual bags.



3,674,196

CENTRIFUGAL MIXING AND EXTRACTION APPARATUS

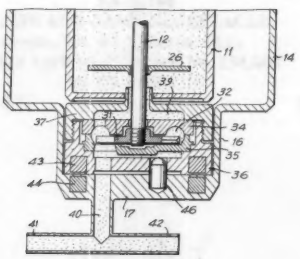
Heinrich Gutter, Karlsruhe, Germany, assignor to Gesellschaft Zur Wiederaufarbeitung von Kernbrennstoffen m.b.H., Leopoldschafen, Germany

Filed Feb. 3, 1970, Ser. No. 8,320

Claims priority, application Germany, Feb. 13, 1969, P 19 07 195.5

Int. Cl. B04b *1/00, 3/00, 9/02*

U.S. Cl. 233—4 **6 Claims**



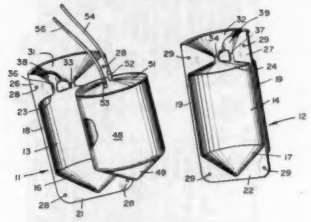
A centrifugal mixing and extraction device, suitable particularly for mixing and extracting radioactive fluids, is designed for rapid cleaning and/or replacement of the mixing chamber and separation bowl. The entire unit, including motor, drive shaft, separator bowl, mixing chamber and impeller, is literally hung from a frame in a casing enclosing the bowl, mixing chamber and impeller. In operative position, the mixing chamber is restrained from rotation with the impeller, the bowl and the shaft by means of magnets in the lower portion of the chamber and the casing, by one or more studs fixed in one of the walls thereof and axially engageable with corresponding recesses in the other, or both. The entire unit can simply be lifted out of the casing, e.g., by disengaging the magnets, without interrupting the extraction process.

3,674,197

WASHING MEANS FOR FLEXIBLE BAGS IN SPLIT ENCLOSURES

David F. Mitchell, Trumbull, and William A. Romanauskas, Southbury, both of Conn., assignors to Ivan Sorvall, Inc., Newton, Conn.

Filed Sept. 8, 1970, Ser. No. 70,273
Int. Cl. B04b *15/02*
U.S. Cl. 233—14 R **11 Claims**



Improved enclosure for supporting flexible bags within a centrifuge rotor for washing biological particles in a closed system. Each collapsible bag is enclosed and supported by a juxtaposed pair of half-shells forming a unitary cavity or chamber to which the filled bag conforms during centrifugation. The enclosure serves to prevent undue wear and stress upon the rotor receptacle and, at the same time, safeguards the integrity of the flexible bag during centrifugation.

ERRATUM

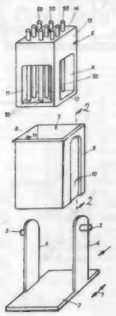
For Class 233—19 A see:
Patent No. 3,674,206

3,674,198

RECEPTACLE HOLDER FOR CENTRIFUGES

Gunter Eberle, Gartenstrasse 100, D-7200 Tuttlingen, Germany

Filed June 22, 1970, Ser. No. 48,142
Int. Cl. B04b *9/12*
U.S. Cl. 233—26 **12 Claims**



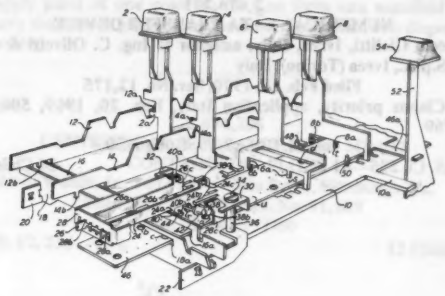
A holder for centrifuges, for receiving specimen containers such as test tubes holding substances to be centrifuged, comprising three major parts which are connected in a form-fitting manner, namely a stirrup member, a cup member therein, and a frame in the latter, with bores in the frame for the test tubes. The cup member is preferably transparent, and the frame has apertured side portions that allow inspection of the substances in the test tubes. Photo-electric means may be provided for automatically controlling the energization of the centrifuge, depending on the progress of the settling process.

3,674,199

KEYBOARD CONTROL MEANS

Mats Erik Mattsson, Sollentuna; Bjorn Sven Hilding Eriksson, Jakobsberg, and Claes-Goran Lindelow, Taby, all of Sweden, assignors to Svenska Dataregister AB, Solna, Sweden

Filed April 20, 1970, Ser. No. 30,200
Claims priority, application Sweden, April 29, 1969, 6052/69
Int. Cl. G06c *7/04, 25/00*
U.S. Cl. 235—26 **14 Claims**



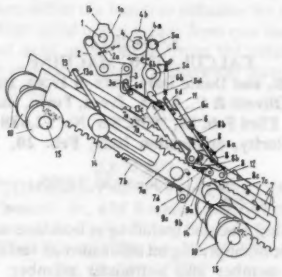
A cash register or other business machine keyboard having at least two key rows and including a device for preventing and permitting, respectively, depression of the keys, said device comprising a blocking slide arranged in a first of the key rows and at least one blocking link in the second row, both the slide and the link each being movable to two respective positions. The slide is provided with first and second sets of non-blocking parts which respectively permit the keys in the first and second rows to be depressed. When the blocking slide is in a given position, at least one of the keys in the key rows can be depressed by the non-blocking parts while the other keys are prevented from being depressed by the blocking parts of the blocking side.

3,674,200

SELECTOR AND SETTING DEVICE FOR THE SYNCHRONOUS OPERATION OF AT LEAST TWO MULTI-DENOMINATIONAL COUNTERS IN A MACHINE SUCH AS A CASH REGISTER CAPABLE OF EFFECTING PRINTING OPERATIONS

Rudolf Gruenig, Koeniz; Erwin Berger, Thoerishaus, and Charles Sieber, Fribourg, all of Switzerland, assignors to Hasler A.G., Berne, Switzerland

Filed Jan. 27, 1971, Ser. No. 110,208
Claims priority, application Switzerland, Jan. 29, 1970, 1235/70
Int. Cl. G06c *11/04, 23/00*
U.S. Cl. 235—60 R **8 Claims**



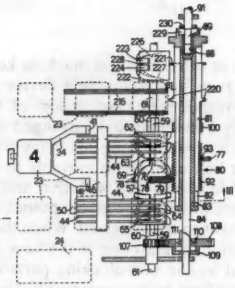
In a machine capable of effecting printing operations and including at least two multi-denominational counters the counters are formed by side-by-side coaxial rotatable wheels

each having a pinion rotatable therewith. The pinions of the wheels of like denomination of the counters are connected by lengthwise movable racks having teeth meshing with the pinions and longitudinal setting movements of the racks effect synchronous setting of the counters. The setting movements of the racks are made by a stepped setting pawl which is selectively engaged with setting teeth formed on the racks.

3,674,201
NUMERICAL DATA TRANSFER DEVICE

Nicolo Giolitti, Ivrea, Italy, assignor to Ing. C. Olivetti & C. S.p.A., Ivrea (Torino), Italy

Filed Feb. 18, 1970, Ser. No. 12,175
Claims priority, application Italy, Feb. 20, 1969, 50659 A/69
Int. Cl. G06c *3/00*; G06g *1/00*
U.S. Cl. 235—61 PC **24 Claims**



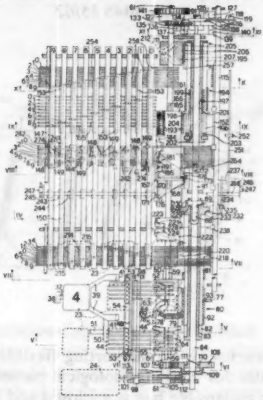
A numerical data transfer device including an input store, a variably positionable output member and a transfer member. The device also includes means for relatively displacing the transfer member and the input store in a first direction, and an actuating means cooperable with the input store during said relative displacement for shifting the transfer member in a second direction. The device further includes means for connecting the transfer member to the output member for positioning the output member in response to the shifting of the transfer member.

3,674,202
CALCULATING MACHINE

Nicolo Giolitti, and Dante Daly, both of Ivrea, Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea, Turin, Italy

Filed Feb. 19, 1970, Ser. No. 12,688
Claims priority, application Italy, Feb. 20, 1969, 50659 A/69
Int. Cl. G06c *9/00*, *13/00*
U.S. Cl. 235—61 PB **19 Claims**

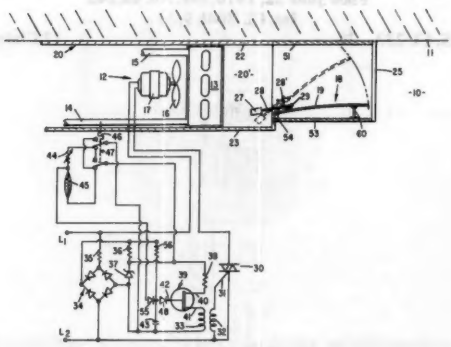
A calculating machine including at least one numerical data transfer device comprising an input store, a variably positionable output member and a transfer member. The transfer member and input store are relatively displaceable in a first direction and actuating means are provided for simultaneously shifting the transfer member in a second direction. In addition, means are provided for connecting the transfer member to the output member for positioning the latter in response to the shifting of the former.



3,674,203
AIR CONDITIONING SYSTEM

William L. McGrath, Syracuse, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed July 27, 1970, Ser. No. 58,314
Int. Cl. F24f *11/04*
U.S. Cl. 236—38 **1 Claim**



A system for supplying treated air to an enclosure, including a heat exchanger through which a heat exchange medium flows and a fan arranged to route air to be treated over the heat exchanger in heat transfer relation with the medium. A control operates to vary the speed of the fan in response to changes in room temperature. One or more damper assemblies operate to maintain the discharge of treated air from the system at a substantially constant velocity, irrespective of the speed of the fan.

3,674,204

CENTRAL HEATING AND WATER SERVICE SYSTEM

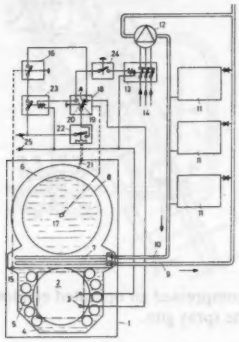
Willi Brandl, 12, Schurbungert, 8057 Zurich, Switzerland

Filed May 26, 1970, Ser. No. 40,612

Claims priority, application Switzerland, May 30, 1969, 8276/69

Int. Cl. F24d *3/08*

U.S. Cl. 237—8 **4 Claims**



A system for supplying central-heating water and consumable (service) water in which the heating plant has an evacuated chamber including a storage vessel for the service water and a heating vessel for the central-heating water, both vessels having thermally conductive walls exposed to vapor within the chamber and heated by condensation of vapor thereon. The vapor (e.g. steam) is heated by electrically controlled means (e.g. an electrically operated oil burner) and the control system is designed such that circulation through the heating vessel of the central-heating water is precluded while the storage vessel of the service water is heated and only thereafter is circulation permitted to occur in the central heating network.

3,674,205

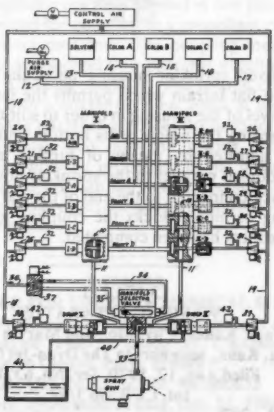
MULTIPLE COLOR PAINT SPRAY SYSTEM

Erhard Kock, Toledo, Ohio, assignor to Champion Spark Plug Company, Toledo, Ohio

Continuation-in-part of Ser. No. 7,465, Feb. 2, 1970, abandoned. This application May 14, 1971, Ser. No. 143,309

Int. Cl. E01b ; E05b *15/02*

U.S. Cl. 239—1 **23 Claims**



A multiple color paint spray system for sequentially supplying selected ones of a plurality of colors to a single spray outlet. A pair of parallel paint manifolds are each connected to the sources of a plurality of colored paints and a solvent. Both manifolds are connected to a single spray gun through a two position valve or to a group of guns each having its two position valve. While paint of one color is being supplied to the outlet from one manifold, the other manifold is conditioned by a solvent purge and filled with the next color to be supplied so that color change to the spray gun or guns may be rapidly effected by switching the two position valve or all the valves simultaneously from one manifold to the other. In a second embodiment, a four-way valve is used to simultaneously supply paint of one color to the gun from one manifold to carry the solvent purge from the second manifold to a disposal source.

3,674,206

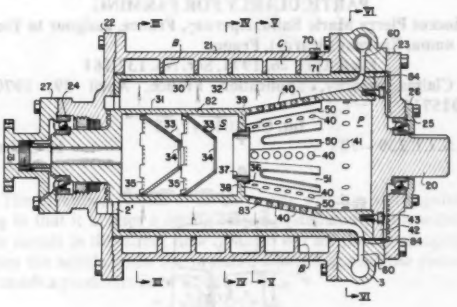
CENTRIFUGAL SEPARATOR WITH MEANS CONTROLLING FLOW

John S. Wendt, Jr., 1013 River Oaks Drive, Pittsburgh, Pa.

Filed Nov. 20, 1970, Ser. No. 91,469

Int. Cl. B04b *11/00*

U.S. Cl. 233—19 A **12 Claims**



A centrifugal separator having a stationary casing and rotating means coaxial with and radially spaced from the casing, the rotating means including an outer shell having an annular inlet passageway, a barrel coaxial with the shell and radially spaced inwardly therefrom to form a primary separation chamber, vanes attaching the barrel to the shell, the barrel having an outwardly flared portion and a cylindrical portion and an end wall closing the large end of the flared portion, a plurality of openings providing communication between the space within the barrel and the space between the barrel and the shell, means within the barrel to enhance the separation of the mixture, first radial outlet means from one end of the barrel and second axial outlet means from the other end of the barrel, and an annular discharge passageway from the primary separation chamber.

3,674,207

AUTOMATED PAINT SPRAY SYSTEM

Emidio J. Carbonetti, Jr., 658 Ruskin Lane, Yeadon, Pa., and Lewis Conover, 1146 Taylor Drive, Folcroft, Pa.

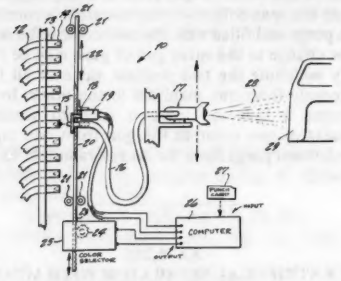
Filed Nov. 6, 1970, Ser. No. 87,536

Int. Cl. B05b *13/00*

U.S. Cl. 239—69 **3 Claims**

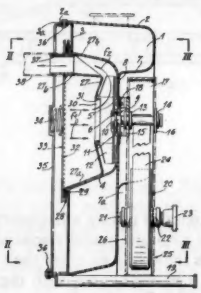
In a production line system, apparatus is disclosed whereby a succession of production work articles are painted by a spray

gun which is coupled selectively by automatic selection and coupling means to different paint supply lines of different



colors in accordance with data signals delivered from a computerized data input and storage system.

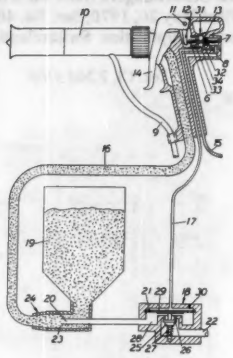
3,674,208
DEVICE FOR SPRAYING TREATMENT PRODUCTS USED PARTICULARLY FOR FARMING
Vincent Pierre Marie Ballu, Epernay, France, assignor to Tecnoma, Epernay (Marne), France
Filed April 26, 1971, Ser. No. 137,161
Claims priority, application France, April 29, 1970, 7015716
Int. Cl. A01n *17/08*
U.S. Cl. 239—77 **15 Claims**



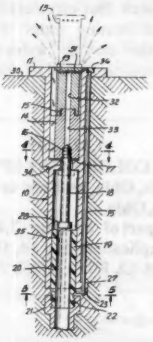
The device to atomize and spray liquid and pulverulent treatment products comprises a tank partly in the shape of a truncated cone, a turbine is placed in the bottom of the truncated part under a complementary shaped baffle-plate covering said turbine and an outlet nozzle is provided. The shaft of the turbine is passing through a panel delimited by the tank and protruding into the portion of the tank which is opposite to the truncated part.

3,674,209
SPRAY GUN
Kurt Herman Liedberg, Skara, Sweden, assignor to Atlas Copco Aktiebolag, Nacka, Sweden
Filed Sept. 24, 1970, Ser. No. 74,970
Claims priority, application Sweden, Oct. 6, 1969, 13699/69
Int. Cl. B05b *7/12*
U.S. Cl. 239—143 **8 Claims**

A spray gun has a trigger actuated maneuvering pressure reduction valve therein. The maneuvering pressure upon depression of the trigger acts on a main pressure reduction valve thereby infinitely variably controlling the supply of compressed air to a compressed air operated ejector feeding spraying material to the spray gun.



3,674,210
SPRINKLER HOUSING
Frank Faragasso, 3048 Waverly Ave., Oceanside, N.Y.
Filed Sept. 21, 1970, Ser. No. 74,086
Int. Cl. B05b *15/10*
U.S. Cl. 239—204 **2 Claims**

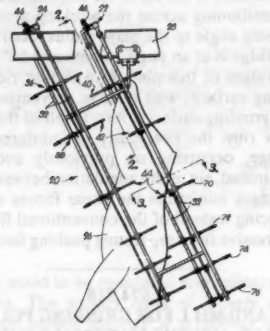


An improved sprinkler housing particularly adapted for mounting on flat terrain which permits the installer to easily adjust the level of the housing in order to suit the local terrain without changing the nipple at its bottom end. The sprinkler housing is adjusted by means of turning a rod which is pivotably coupled parallel to the sprinkler housing so that an eccentric lock connected to the end of the rod and engaged to the coupling or nipple, locks the coupling after the proper height adjustment has been completed.

3,674,211
WASHING APPARATUS
Frank H. Gage, Kansas City, Mo., and Marvin L. Zabel, Overland Park, Kans., assignors to The Dyna-Jet Corporation
Filed Aug. 12, 1970, Ser. No. 63,055
Int. Cl. B08b *3/02*
U.S. Cl. 239—247 **2 Claims**

Washing apparatus having a fluid delivery assembly, one form of the invention being intended for washing objects which are moved past the fluid delivery assembly, the other

form having the fluid delivery assembly movably mounted whereby it may be moved with respect to the object to be washed. Any given number of the fluid delivery assemblies may be utilized, either fixed or movable, each of the fluid delivery assemblies including a first, generally horizontal



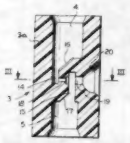
stretch of a pipe, and a second stretch of pipe extending downwardly from the first stretch, there being a plurality of nozzles shiftably carried by the pipes of the fluid delivery assembly and a single prime mover for each fluid delivery assembly for oscillating the nozzles whereby to obtain the maximum washing action upon the object to be washed.

3,674,212

ONE PIECE COUPLER-ASPIRATOR-NOZZLE

Jean Marand, Norwalk, Conn., assignor to Ciba-Geigy Corporation

Filed July 29, 1970, Ser. No. 59,137
Int. Cl. B05b 7/04
U.S. Cl. 239—308 **5 Claims**



A coupler-aspirator-nozzle is formed in one piece. Coupling means are provided for coupling to a propellant cartridge and a separate product container. The coupling means communicate with first and second flow passages which in turn communicate with a mixing chamber. The mixing chamber then communicates with a nozzle opening. Flow of the propellant through the mixing chamber aspirates the product through the second flow passage and into the mixing chamber. The product is mixed with the propellant in the mixing chamber and then is sprayed through the nozzle opening. An indexing guide is provided to prevent the coupler-aspirator-nozzle from becoming disoriented.

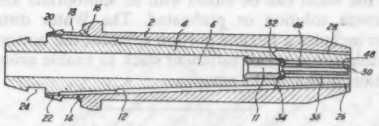
3,674,213

CUTTING HEAD FOR THERMOCHEMICAL MACHINING

Jean Le Mounier, Auxonne, France, assignor to L'Air Liquide, Societe Anonyme Pour L'Etude et L'Exploitation Des Procedes Georges Claude, Paris, France

Filed Oct. 14, 1970, Ser. No. 80,632
Claims priority, application France, Oct. 21, 1969, 6935976
Int. Cl. B05b 7/06
U.S. Cl. 239—425 **10 Claims**

In this cutting head for thermochemical machining by an oxygen jet surrounded by heating flames, a curtain of oxygen is interposed between the flames and the jet. The curtain is supplied by the cutting oxygen and prevents the pollution of



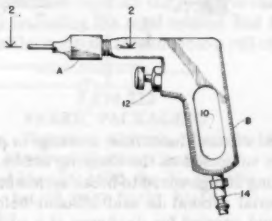
the oxygen jet by the flames. A cutting nozzle divides the oxygen stream into the central, cutting jet and the protective curtain.

3,674,214

AIR NOZZLES

Lowell N. Brown, 11612 Bowling Green Drive, St. Louis, Mo.

Filed Aug. 24, 1970, Ser. No. 66,347
Int. Cl. B05b 7/02
U.S. Cl. 239—526 **3 Claims**



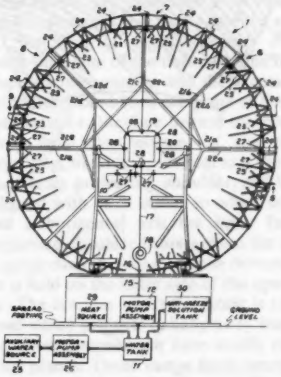
The invention relates to an air nozzle which is self-regulating in that it utilizes a spring-biased castellated piston within the nozzle in the direct flow of air to cut off the air escaping from the nozzle when the pressure exerted against the piston exceeds a predetermined value.

3,674,215

SNOW AND ICE REMOVAL SYSTEM FOR AN ANTENNA

M. Otto Erdmann, Denville, N.J., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Nov. 25, 1970, Ser. No. 92,719
Int. Cl. A62c 31/10
U.S. Cl. 239—548 **9 Claims**



Water is pumped for a predetermined time at a given rate from a water tank, burried below ground level to prevent freezing, to a plurality of spray nozzles appropriately posi-

tioned about the reflecting surface of an antenna so that the water discharged from the plurality of nozzles completely covers the reflecting surface to remove accumulations of ice and/or snow thereon. Under extreme temperatures conditions, the water can be mixed with an appropriate amount of anti-freeze solution or preheated. The Water distribution system includes a flexible portion adjacent the bottom of the reflecting surface with sufficient slack to enable azimuth and elevation motion of the antenna.

3,674,216

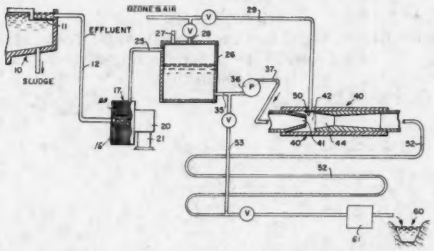
TREATING LIQUID WASTE EFFLUENT

Richard L. Blair, 249 Mattson Ave., Los Gatos, Calif.

Filed July 2, 1970, Ser. No. 51,999

Int. Cl. B02c *13/10, 13/28*

U.S. Cl. 241—18 **7 Claims**



The liquid waste effluent from a sewage or plant waste treating plant is subjected to the shearing action of a wire brush wheel turning at high speed to break up minute particles of organic material present in said effluent before the latter is sterilized and aerated for discharge at a suitably low B.O.D. and bacteria count levels.

3,674,217

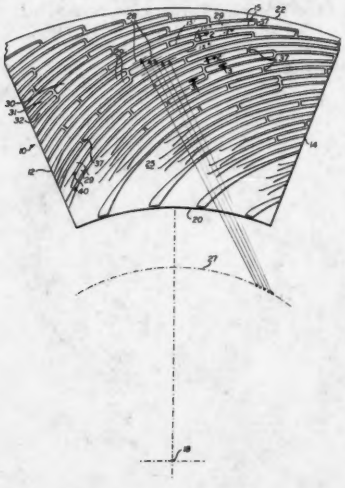
PULP FIBERIZING GRINDING PLATE

Rolf Bertil Reinhall, 16, Killingevagen, Lidingo, 3, Sweden

Filed July 30, 1970, Ser. No. 59,660

Int. Cl. B02c *7/12*

U.S. Cl. 241—21 **13 Claims**



A pulp fiberizing grinding plate or disc, known in the art as the "Asplund Defibrator," employed for breaking down wood chips, or the like fibrous material into fibers for use in various pulp employing processes, such for example, as in the paper industry, or the like. The defibrator plate or disc is formed of disc segments with a grinding face having a plurality of upstanding ribs extending across the working area of the plate, with the ribs at the beginning of the working area lying at an angle of between 0° and 60° to a radius intercepting the rib at the commencement of the rib in the working area, with the rib gradually transitioning across the working area at a progressively increasing angle to the plate radius, until at the circumference, the ridge is at an angle of between 65° and 90° to the radius. The ridges of this plate face similar ridges on an opposed grinding surface, with relative movement provided for between the grinding surfaces. As a result of the angulation of the ridges or ribs, the previously encountered problems of fiber breakage, occurring on previously evolved grinding plates is eliminated, since the angulation between the relatively moving ridges minimizes the shear forces exerted on the fibers, producing instead of the conventional fiber cutting action, a compressive fiber separating pushing force.

3,674,218

PROCESS AND MILL FOR GRINDING PULVERULENT MATERIALS, AND THE MATERIALS THUS GROUND

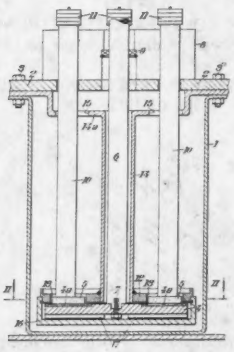
Anatol Globus; Paul Duplex, both of Paris, and Roger Vautier, Bourg-la-Reine, all of France, assignors to Agence Nationale De Valorisation De La Recherche (Anvar)

Filed Aug. 12, 1969, Ser. No. 849,324

Claims priority, application France, Aug. 13, 1968, 68162875

Int. Cl. B02c *7/00*

U.S. Cl. 241—46.06 **7 Claims**



The material or materials to be ground are put in suspension in a liquid, and this liquid is made to pass in a continuous and repeated manner between two rubbing surfaces. The pressure of application of one surface against the other is comprised between a few tens of g/cm² and a few kg/cm². One of the rubbing surfaces forms part of a horizontal disc driven by a vertical shaft, and the other rubbing surface comprises a plurality of stationary shoes resting on the disc. At least one of the rubbing surfaces can be made of the same material as the material to be ground.

3,674,219

GREEN-WOOD FIBRATING MEANS AND METHOD

Herbert C. Harvey, Jr., Knoxville, Tenn., assignor to Tennessee Valley Authority

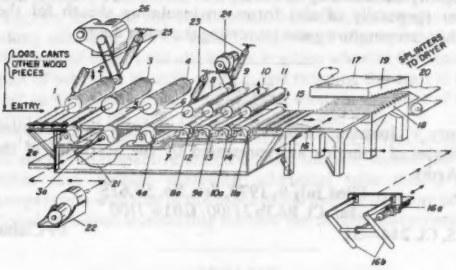
Filed July 24, 1970, Ser. No. 58,081

Int. Cl. B03c *21/00;* **B27l** *11/08*

U.S. Cl. 241—152 R **6 Claims**

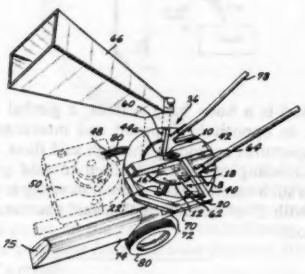
A process and apparatus for converting solid pieces of timber into slender, splinter-like strands of wood fiber of more

or less uniform thickness. Timber first passes through a series of rolls revolving at uniform or variable controlled speeds. The rolls have varying thread-like configurations and are vertically activated under controlled pressure of such magnitude as to



cause the solid wood to be separated into splinter-like strands along the grain. The spongy mass of loosely matted fiber strands are then passed through a scrubbing device to be pulled apart.

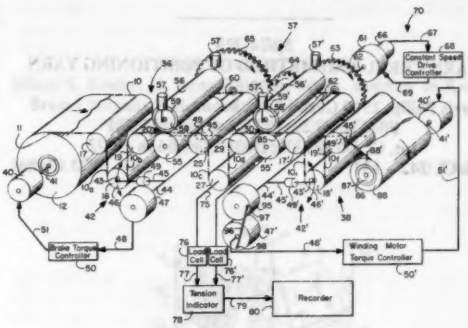
3,674,220
CHIPPER SHREDDER
Myron D. Tupper, Sandy, and Arvin A. Hille, Oswego, both of Oreg., assignors to Omark Industries, Inc., Portland, Oreg.
Filed Dec. 7, 1970, Ser. No. 95,432
Int. Cl. B02c *13/16*
U.S. Cl. 241—186 R **9 Claims**



A chipping knife and shredder flails are mounted for rotation about a common axis. The chipping knife is mounted in radial alignment with and adjacent the center of axis and a hopper directs branches, etc. to be chipped into that central portion dominated by the chipping knife. The flails extend outside of the chipping knife and a second hopper directs material to be shredded into that area dominated by the flails.

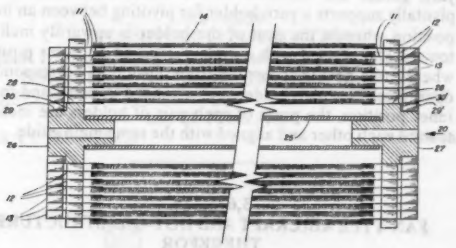
3,674,221
DYNAMIC STRESS-STRAIN TESTING OF RIBBONS OF FILM
Coenraad E. Riemersma, Springfield Township, Hamilton County, Ohio, assignor to The Proctor & Gamble Company, Cincinnati, Ohio
Filed May 13, 1970, Ser. No. 36,820
Int. Cl. B65h *23/08, 23/22*
U.S. Cl. 242—75.51 **14 Claims**

This disclosure refers to an improved method and apparatus for dynamically, non-destructively testing ribbons of film to determine the stress-strain characteristics of the film under conditions substantially identical to the conditions to be imposed on the same film during subsequent processing. Specifically, a moving ribbon of film is first subjected to constant tension and is thereafter looped through a pair of constant surface speed nips, the surface speeds of which are selected to cause the film to elongate a pre-determined constant amount as it passes from one to the other. Total tension parallel to the



machine direction of moving the film is continuously sensed in the looped film path intermediate the nips. Provision is made for continuously recording the total tension and for winding the tested film, under constant tension, into a roll of film.

3,674,222
FABRIC PACKAGING
Yale H. Smiley, Waterloo, Ontario, Canada, assignor to Uniroyal Ltd., Montreal, Quebec, Canada
Filed May 25, 1970, Ser. No. 40,150
Int. Cl. B65h *75/02, 75/28*
U.S. Cl. 242—77.1 **15 Claims**



Pile and similar fabrics are prevented from matting when rolled up by attaching at each side of the fabric a strip having two shoulders, the first of which projects downwardly therefrom beneath the plane of the bottom of the fabric when the fabric is disposed horizontally, and the second of which projects upwardly therefrom above the plane of the top of the fabric. The inner face, i.e. the face toward the center of the fabric and away from the selvage, of the second, or downwardly projecting, shoulder is vertical as is the outer face of the first, or upwardly projecting, shoulder, and these vertical faces are aligned with each other, so when the fabric is rolled up about a horizontal axis the inner face of the downwardly projecting shoulder bears against the outer face of the upwardly projecting shoulder, and the downwardly projecting shoulder is held on the outer side of the upwardly projecting shoulder. The core on which the fabric is rolled has a flange at each end which projects radially away from the axis of the core, and these flanges each have axially outer faces which lie in radial planes. These flange faces are adapted to bear against the inner face of the downwardly projecting shoulder of the strip on the first wrap of the fabric about the core. The planes of the flange faces are spaced apart a sufficient distance axially of the core that the fabric is held taut

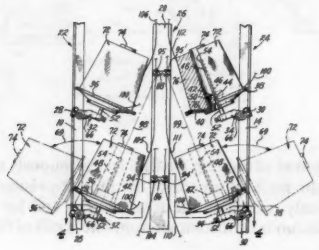
and lies along a helical, or substantially helical, path around the core axis. The thickness of at least one of the shoulders on each strip measured normal to the plane of the surface of the fabric is at least equal to, and preferably slightly greater than, the thickness of the fabric.

3,674,223

YARN CREEL AND METHOD OF POSITIONING YARN CONES

Morris Philip, 2519 Grand Ave., Bronx, N.Y.

Filed April 29, 1971, Ser. No. 138,581
Int. Cl. D02h *1/00*; D03j *5/08*; B65h *49/02*
U.S. Cl. 242—131 **21 Claims**



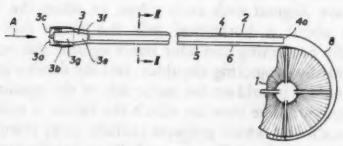
Spaced apart uprights interconnected by headers form a vertical longitudinally extending creel frame having an open front face, a laterally spaced apart open rear face, and an inner zone between the faces. A plurality of transversely spaced apart longitudinally extending bars are mounted adjacent each face, each bar supporting a plurality of longitudinally spaced apart hinges. Main yarn guides and auxiliary yarn guides are mounted in the inner zone. Each hinge pivotally supports a yarn holder for pivoting between an inner position wherein the post of the holder is upwardly inclined toward and aligned with a main guide and an outer position wherein the post is accessible from outside its corresponding open face. The yarn holders are arranged in pairs, and in the inner position, the posts of each pair of holders are inclined toward each other and aligned with the same main guide.

3,674,224

FAN-TYPE AIRCRAFT AND HOT-GAS STRUCTURE THEREFOR

Jan Konecny, Buxtehude; Jan T. Haas, and Hans E. Groenewald, both of Hamburg, all of Germany, assignors to Hamburger Flugzeugbau GmbH, Hamburg-Finkenwerder, Germany

Filed Feb. 17, 1970, Ser. No. 11,971
Claims priority, application Germany, March 21, 1969, P 19 14 474.2
Int. Cl. B64c *15/14*
U.S. Cl. 244—12 B **8 Claims**



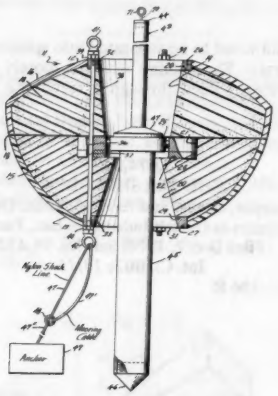
An aircraft is disclosed whose fixed airfoils and/or fuselage is provided with one or more fans for producing lift, forward thrust or both, wherein the motive power for the fans is derived from the formation of hot gases in an external-combustion system such as a gas-generating turbine. The gas generator is of the two-stage type having a high-temperature output which is communicated to the fans by an inner duct composed of a thin-wall refractory metal. The relatively low-temperature output of another stage of the gas generator (e.g. the compressor) is communicated to the fans by an outer duct coaxially surrounding the inner duct whereby the outer gas layer (generally of air) forms an insulating sheath for the higher-temperature gases traversing the inner duct.

3,674,225

BUOY

Henry V. Johnson, Panama City, Fla., assignor to The United States of America as represented by the Secretary of the Army

Filed July 9, 1970, Ser. No. 53,615
Int. Cl. B63b *21/00*; G01w *1/00*
U.S. Cl. 244—31 **19 Claims**



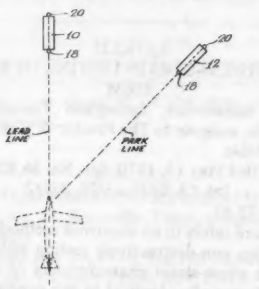
Disclosed is a buoy have a float, a gimbal ring assembly mounted in oppositely disposed and interconnected frusto-conical apertures extending through said float, an instrument package housing releasably latched to said gimbal ring assembly in such manner as to allow it to swing in pendulum like manner with 2° of freedom within said apertures with respect to said float.

3,674,226

AIRCRAFT PARKING METHOD AND MEANS

Richard Z. Wasson, Flossmoor, Ill., assignor to Federal Sign and Signal Corporation, Chicago, Ill.

Filed April 6, 1970, Ser. No. 25,859
Int. Cl. B64f *1/22*
U.S. Cl. 244—114 R **15 Claims**

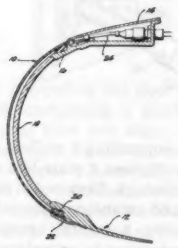


Method and means for parking aircraft in selected position for cooperation with jetway passenger ramps; the means being

characterized by a first pair of neon tubes having a position of visual alignment defining a lead line and a second pair of neon tubes having a position of visual alignment defining a park line intersecting said lead line, the point of intersection of the two lines being located at the selected parking position; the method being characterized by the steps of steering the craft to a position wherein the first pair of tubes are visually aligned whereby to locate the craft on said lead line, taxiing the craft along said lead line by maintaining visual alignment of said first pair of tubes until attaining a position wherein the second pair of tubes are visually aligned, and stopping the craft in the last named position, i.e., the position wherein the pilot of the aircraft sits at the point of intersection of said lines.

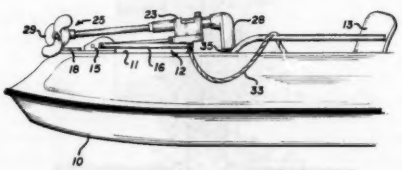
To facilitate spot parking of different types, styles, or sizes of aircraft in respective selected spots, the said second pair of tubes may include therewith additional tube means for cooperation with one of the tubes of the pair for defining additional park lines intersecting the lead line at different points.

3,674,227
FRAGMENTING COVER
Stanley I. Jacobson, Los Angeles, and John R. Sansbury, Chatsworth, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.
Filed March 23, 1970, Ser. No. 24,913
Int. Cl. B64d *7/00*
U.S. Cl. 244—121 **20 Claims**



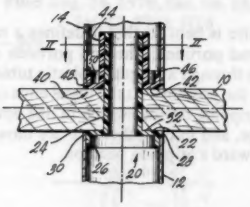
A protective cover for a window is made of fragmentable material, and is equipped with a fragmenting actuator so when it is desired to remove the cover, the fragmenting actuator fragments the cover. In the preferred embodiment, the cover is a dome over a window for a radiation detector, for example, in the nose of a missile.

3,674,228
BRACKET FOR MOUNTING BOAT ACCESSORY
George F. Horton, Rte. 2, Box 718, Fort Worth, Tex.
Filed July 14, 1970, Ser. No. 54,819
Int. Cl. F16m *1/02*
U.S. Cl. 248—4 **7 Claims**



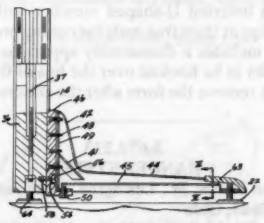
An extensible hinged bracket for mounting a boat accessory such as an auxiliary outboard electric motor on the forward deck, gunwale or transom of a small boat and comprised of a horizontal mounting plate, spaced generally parallel link arms pivotally connected at corresponding ends to the mounting plate for substantially 180° movement thereabove, the remaining ends of said link arms being spaced and pivotally connected to the ends of a movable support on which the accessory is mounted. A cushion is provided at one end of the mounting plate for supporting the accessory when the bracket is retracted.

3,674,229
SHELVING SUPPORTS
Miner S. Keeler, II, Grand Rapids, Mich., assignor to Keeler Brass Company, Grand Rapids, Mich.
Filed March 9, 1970, Ser. No. 17,524
Int. Cl. A47b *57/06*
U.S. Cl. 248—188 **11 Claims**



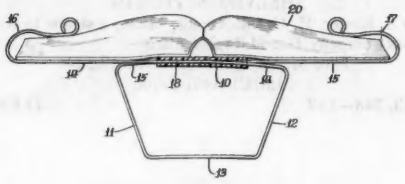
Supporting apparatus and method of assembly of the same for shelves, the apparatus featuring a cylindrical male bushing the neck of which mates with a circular hole in the shelf and with a cylindrical female bushing. Both bushings have a shoulder and a flange extending outwardly therefrom which allow the bushings to abut and support or be supported by steel tubes comprising the main legs of the shelving.

3,674,230
FURNITURE CONSTRUCTION
Robert L. Propst, 2285 S. State Road, Ann Arbor, Mich.
Division of Ser. No. 736,857, June 13, 1968, Pat. No. 3,572,263. This application June 12, 1970, Ser. No. 57,867
Int. Cl. F16m *11/20*
U.S. Cl. 248—188.8 **5 Claims**



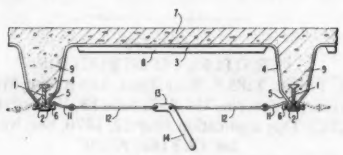
This disclosure relates to a furniture construction having a plurality of vertically disposed space divider components which are rigidly secured together by connector post structures. The divider has a stabilizer means in the form of brackets at the floor to counterbalance modular units which can be supported by the post structures. The bracket member is attached to the post structure through a supporting bar and a screw, the head of which screw is positioned in a slot in the supporting bar between the post structure and the bracket member. Means are provided on the radial edges of the screw for turning the screw to attach the bracket construction to the bottom portion of the connector post structure. The same bracket is interchangeably useable as a support for cantilevered furniture components mounted on the space divider.

3,674,231
BOOKHOLDER
Isabelle J. Lewis, Naperville Road, Bartlett, Ill.
Filed Sept. 24, 1970, Ser. No. 75,089
Int. Cl. A47b *97/04*
U.S. Cl. 248—451 **4 Claims**



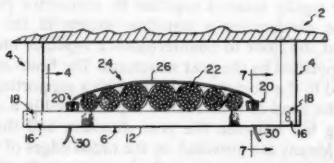
A length of wire is bent so that it defines a rectangle with two extending end portions. The end portions extend in opposite directions through a length of plastic tubing which frictionally engages the portions. At the distal ends of the end portions are page gripping devices which in one embodiment are "U" shaped clips, and in the other one are movable jaw clips spring loaded toward a gripping position.

3,674,232
METAL FORMS HAVING A PARTICULAR SHAPE FOR REALIZING SUSPENDED FLOORS
Giovanni Varlonga, Via B. Verro N. 90, Milan, Italy
Filed June 4, 1969, Ser. No. 830,258
Int. Cl. E04g *13/04*
U.S. Cl. 249—23 **5 Claims**



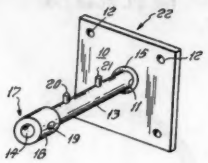
A concrete-suspended floor construction form arranged to rest on the main beams of the suspended floor and which is formed as an inverted U-shaped member with inclined side walls having lips at their free ends for resting on the beam. The form further includes a disassembly apparatus comprising tie rods and hooks to be hooked over the lips of the form when it is desirable to remove the form after the concrete has set.

3,674,233
HANGER SYSTEM
Harold S. Van Buren, Jr., Lexington, Mass., assignor to TRW Inc., Cleveland, Ohio
Filed July 2, 1970, Ser. No. 51,870
Int. Cl. F16l *3/22*
U.S. Cl. 248—68 **11 Claims**



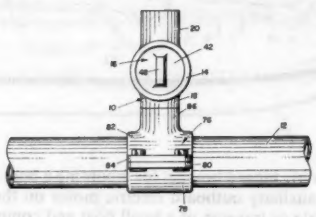
A hanger apparatus for supporting a cable run. The cables overlie a supporting channel extending transverse to the run and having a plurality of spaced slots formed therein. A pair of fastener clips are snap seated in selected of the spaced slots in the supporting channel and are generally located adjacent the outboard cables of the run. Each of the fastener clips carries an internally disposed latching element. A flexible strap of a selected length has a series of spaced slots formed therethrough and defining a series of spaced rungs therebetween. The medial portion of the strap is looped over the cable run and its end portions are threaded through the clips. The terminal ends of the strap are free. The latching element on each clip is seated in one of the slots in the strap and hooks over the adjacent rung thereby securing the strap to the clips. The strap may be tightened to provide an optimum clamping tension on the cables by axially pulling on either or both ends of the strap in that the latching element will automatically index to a seat in one of the succeeding slots in the strap in a ratchetlike manner responsive to the pull.

3,674,234
CONSTRUCTION SUPPORT MEANS
John Joseph Davin, R.D. 2, Box 214, Troy, N.Y.
Filed July 7, 1970, Ser. No. 52,917
Int. Cl. E04g *3/00*
U.S. Cl. 248—239 **2 Claims**



A structural aid for supporting a scaffold or bracket from a vertical wall which comprises a plate-like member having a central opening therethrough. Disposed in said opening rigidly affixed to said plate and extending outwardly thereof a main support member having a central aperture longitudinally therethrough and terminating in an enlarged reinforced end portion. Intermediate the ends of said main support, said support being provided with one or more vertical upstanding pins for engaging and mating with apertures carried by the structures to be supported. Where necessary, said enlarged end portion is formed with a lateral threaded opening therethrough for inserting a screw to lock said structural aid to a "snap tie" or other extending rod.

3,674,235
PLASTIC VALVE
Donald E. Porter, and Jack Burkholder, both of Tulsa, Okla., assignors to Water and Gas Plastics Products, Tulsa, Okla.
Filed Feb. 16, 1970, Ser. No. 11,465
Int. Cl. F16k *25/00, 1/22*
U.S. Cl. 251—162 **2 Claims**



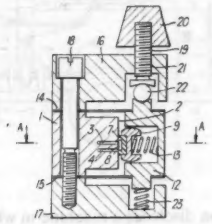
A plastic valve for use in connection with a tapping machine or tapping tool during a tapping operation on a plastic flow for

connection of a by-pass line, or the like, thereto. The plastic valve comprises means for securing thereof to the flow line for receiving a tapping machine therethrough. During the tapping operation, the valve is in an open position for precluding interference with the tapping operation. Subsequent to removal of the tapping machine the valve may be closed for precluding leakage of fluid from the flow line during the connection of the by-pass, or the like, thereto. Upon completion of the work operation, the valve may be opened again to provide communication between the flow line and the by-pass line.

3,674,236
VALVE

Roger Commarmot, Lyon, France, assignor to Rhone-Poulenc S.A., Paris, France

Filed Feb. 6, 1970, Ser. No. 9,320
Claims priority, application France, Feb. 7, 1969, 6902908
Int. Cl. F16k *31/50*
U.S. Cl. 251—176 **2 Claims**

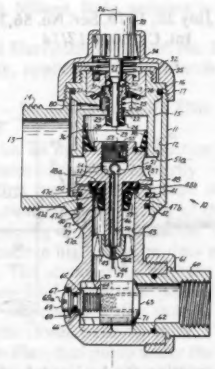


The valve for controlling the flow of a fluid, particularly very small flows, comprising a block having at least one smooth face and at least two ducts extending through the block and terminating in the smooth face in an orifice. A slide is guided for movement substantially parallel to the smooth face and is moved, e.g. by means of a screw or pneumatically. A valve element movable with the slide is urged into sliding contact with the smooth face and a recess in the valve element is dimensioned to overlie and connect at least two of the orifices in at least one position of the slide.

3,674,237
FLUSH VALVE

William T. Heyer, 225 Mohawk Road, and Dale F. Soukup, 318 Mohawk Road, both of Santa Barbara, Calif.

Filed Oct. 28, 1970, Ser. No. 84,789
Int. Cl. F16k *31/44*
U.S. Cl. 251—32 **18 Claims**

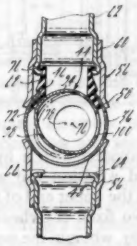


A differential pressure valve for operation over a wide range of system pressures, including relatively low domestic water supply pressures. A probe extends upstream to pick up relatively higher pressure to actuate the valve workings. A yieldable restrictor regulates the pressure drop across the workings of the valve to maintain a suitable pressure differential, and a ball-detent type mechanism provides a snap action from open to closed condition so that the valve does not dither. A shoulder laterally deflects the water passed by the valve in a folded pattern known as the "Coanda" effect, which lessens the forces needed to close the valve and protects the actuating member from sand and other deleterious solid material.

3,674,238
TUBULAR VALVE AND BODY STRUCTURE

Joseph Pickles, Birmingham, and Chester S. Fudala, Detroit, both of Mich., assignors to Ferro Manufacturing Corporation, Detroit, Mich.

Filed Aug. 24, 1970, Ser. No. 66,477
Int. Cl. F16k *3/26*
U.S. Cl. 251—309 **5 Claims**

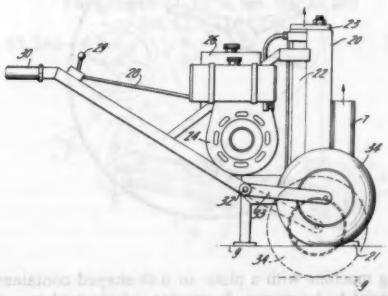


Valve structure in which a hollow generally tubular valve housing having opposed lateral ports is provided at its interior with a rotatable generally tubular valve body having opposed lateral openings and shaped such that upon rotation an imperforate wall portion of the valve body moves into closing relation with one of the ports of said valve housing.

3,674,239
POLE-PULLING DEVICE

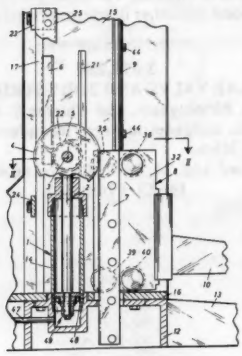
Reinhard Wirtgen, Windhagen uber Linz/Rhine, Germany

Filed April 25, 1969, Ser. No. 819,273
Claims priority, application Germany, April 27, 1968, P 17 59 410.4
Int. Cl. E21b *19/00*; B60p *1/00*
U.S. Cl. 254—2 R **3 Claims**



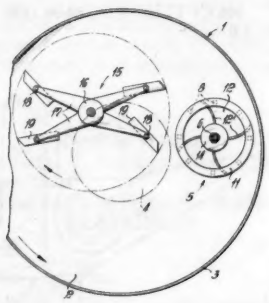
A pole pulling device comprising a frame mounted on wheels which can be raised so that a base support means can be lowered to the ground to surround the pole to be extracted. The frame supports a reciprocating lift means which engages the pole.

3,674,240
LIFTING DEVICE
Bertil Ivar Torsten Larsson, Norrgard S-330, 10 Bredaryd, Sweden
Filed Dec. 15, 1969, Ser. No. 884,991
Claims priority, application Sweden, Feb. 13, 1969, 1959/69
Int. Cl. B66f 3/02
U.S. Cl. 254—95 **8 Claims**



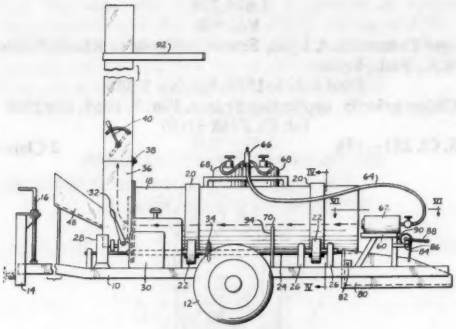
A lifting device provided with a hydraulic unit having a pressure cylinder and a piston rod and a transverse shaft rotatably mounted on the upper end of the piston rod and having affixed thereto two fixed cogwheels, one having a larger diameter than the other, wherein the one cog wheel engages in a fixed rack and the second cog wheel engages in a rack movable vertically with a carrier device. The carrier device is movable vertically along a vertical rail or the like.

3,674,241
MIXING MACHINE
Wilhelm Eirich, Walldurner Str. 41, and Gustav Eirich, 19 Bahnhofstrasse, both of Hardheim/Nordbaden, Germany
Filed Aug. 12, 1970, Ser. No. 63,147
Claims priority, application Germany, Aug. 16, 1969, P 19 41 831.6; Jan. 22, 1970, P 20 02 641.9
Int. Cl. B01f 9/10
U.S. Cl. 259—15 **26 Claims**



Mixing machine with a plate- or dish-shaped container for the material to be mixed. A rotating mixing tool is accommodated in the container so as to rotate about an axis eccentric to the axis of the container. The axis of the tool is forcibly caused to perform a relative movement in relation to the mixing plate. The mixing tool comprises a flat disc-like rotary element which is arranged at the free end of its shaft. Rods are arranged in the rotary element which are substantially parallel or inclined in relation to the shaft. For higher speeds a ring is secured at the free ends of the rods which keeps the rods in place in spite of large centrifugal forces.

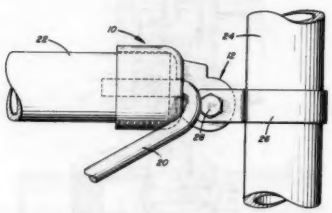
3,674,242
PREPARATION OF ASPHALT PAVING MATERIAL
Clarence K. Stewart, 3936 Spanish Trail, Fort Wayne, Ind.
Filed Jan. 4, 1971, Ser. No. 103,749
Int. Cl. B28c 5/46
U.S. Cl. 259—158 **10 Claims**



The specification discloses a machine in which asphalt paving materials are treated by mixing and heating the materials, particularly for repair work and the like. The machine consists of an elongated drum rotatable on a horizontal axis and having fins therein for agitating the material as the drum rotates. The asphalt materials, preferably at least partially premixed with an aggregate such as crushed stone, are fed into one end of the drum and progress therethrough to the other end. At the discharge end of the drum, burners supply a hot blast which passes through the drum in counter flow to the asphalt material passing therethrough and is taken off through a stack at the opposite end of the drum.

A tray at the discharge end of the drum receives the material as it drops out of the drum and is thus in position for a workman to remove the material from the tray by a shovel or by scraping it therefrom and placing it in the paving region to be repaired.

3,674,243
RAIL AND BRACE END COUPLING
Thomas W. Brown, 4104 S. Creek Road E., Chattanooga, Tenn.
Filed July 20, 1970, Ser. No. 56,256
Int. Cl. E04h 17/14
U.S. Cl. 256—65 **2 Claims**



A rail end for securing the horizontal rail in a chain link fence to the vertical post. The rail end has a cup-shaped body with a shank projecting from a transverse wall of the body.

The transverse wall has means to secure a diagonal brace or truss rod to it so that no special fitting is needed when such a diagonal brace is used.

3,674,244

DEVICE FOR MAKING AERATED SOFT DRINKS

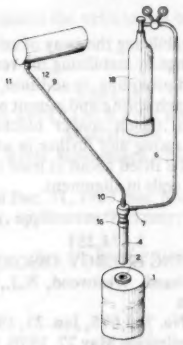
Giancarlo Garavelli, Milan, Italy, assignor to Heron Establishment, Vaduz, Liechtenstein

Filed June 12, 1970, Ser. No. 45,723

Claims priority, application Switzerland, June 18, 1969, 9282/69

Int. Cl. B67d *5/56*

U.S. Cl. 261—18 B 11 Claims



A method and apparatus are disclosed for making soft drinks wherein disposable air tight containers for the syrup are used, the container being placed under pressure by compressed gas, which thus causes the liquid to mix with the gas, and which causes the emulsion thus formed to be conveyed to apparatus for adding water to form the soft drink which is then refrigerated and dispensed.

3,674,245

CARBURETOR FOR INTERNAL-COMBUSTION ENGINE

Luigi Massarotti, Milano, Italy, assignor to Atomjuboll S.r.l., Milano, Italy

Filed March 25, 1970, Ser. No. 23,164

Claims priority, application Italy, March 26, 1969, 14626 A/69

Int. Cl. F02m *3/08, 7/06*

U.S. Cl. 261—28 8 Claims

A carburetor for an internal-combustion engine, equipped with an accelerator-controlled butterfly valve in a mixing channel, has a first fuel-injection nozzle downstream and a second fuel-injection nozzle upstream of that valve, each of these nozzles opening into the channel in the immediate vicinity of a respective high-pressure duct serving to atomize the injected fuel. The atomizer duct for the first nozzle is unblocked under low-load conditions (idling) by a diaphragm-controlled valve responsive to the suction prevailing in the channel beyond the closed butterfly valve. The second nozzle, supplied by an ancillary fuel pump under the control of the accelerator under high-load conditions (kickdown), may have its atomizer duct connected to an air-pressure accumulator which is charged at low load by the pressure differential developed across the butterfly valve.

3,674,246

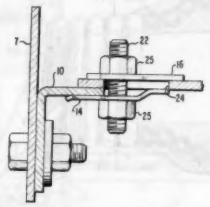
CLAMP ASSEMBLY

Darrell L. Freeman, Tulsa, Okla., assignor to Nutter Engineering Company, Division of Heat/Fluid Engineering Corporation, Tulsa, Okla.

Continuation-in-part of Ser. No. 839,437, July 7, 1969, abandoned. This application Jan. 28, 1970, Ser. No. 6,389

Int. Cl. B01d *3/20*

U.S. Cl. 261—114 R 9 Claims



For use in a refining tower, a bubble tray having a plurality of spaced clamping assemblies operable from either above or below for releasably securing the trays to a marginal support in the tower or an inspection passage-way section within the tray area. Each clamping assembly includes one each of generally rectangular clamping and sealing members having rectangular apertures therethrough mounted on the opposite sides of the tray by means of a rectangular bolt, produced from threaded square shaped metal stock, extending through the apertures and also through an elongated slot in the tray. The bolt has a rectangular cross section slightly less in width than the elongated slot in the tray and the square apertures in the clamping and sealing members, to prevent their rotation relative to the tray while permitting longitudinal sliding movement of these members between an extended position projecting from the edge of the tray for receiving therebetween either the tray support or an adjacent section of tray and a retracted position for release from the securement position. The clamping assembly is maintained on the tray by a pair of nuts received on the opposite ends of the bolt and which also serve to secure the assembly in attached position upon advancement of the nuts on the bolt.

3,674,247

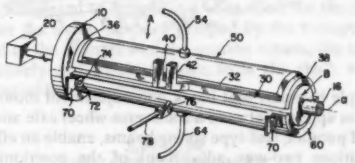
APPARATUS AND METHOD OF INDUCTIVELY HEATING AND QUENCH HARDENING AN ELONGATED WORKPIECE

Jack W. Gillick, Parma, Ohio, assignor to Park-Ohio Industries, Inc., Cleveland, Ohio

Filed March 27, 1970, Ser. No. 23,201

Int. Cl. C21d *1/66*

U.S. Cl. 266—4 E 3 Claims

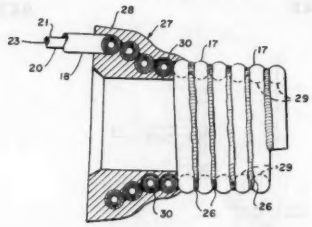


There is provided an apparatus and method for inductively heating and quench hardening a relatively long elongated workpiece wherein the workpiece is inductively heated by an inductor extending substantially the total length of the workpiece while the workpiece is rotated and a quenching head for quench hardening the rotating inductively heated workpiece over its complete length while the workpiece remains in the heating position.

3,674,248
CLOSED END TUYERE COIL

Donald J. Shellenberger, Bethel Park, Pa., assignor to Jones & Laughlin Steel Corporation, Pittsburgh, Pa.

Filed Oct. 9, 1970, Ser. No. 79,379
Int. Cl. C21b 7/16
U.S. Cl. 266—41 4 Claims

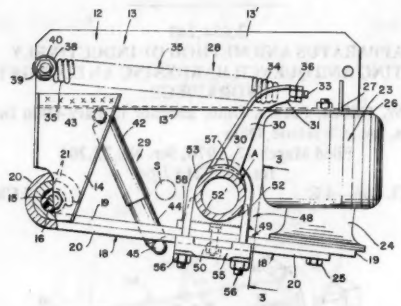


Tuyeres and like articles employed to deliver fluids in extremely hot environments include an arrangement for their cooling comprising a conduit in the form of a coil having a plurality of turns for passing a cooling fluid through the article at high velocities. The conduit consists of an outer tubular member closed at one end to fluid flow and an inner tubular member located within the outer tubular member so as to form an annular passageway between the members. The tubular members are in fluid communication adjacent the closed end of the outer member. Cooling fluid introduced into the conduit first passes through the conduit along the annular passageway, enters the inner tubular member adjacent the closed end of the outer member, and passes through the inner tubular member to exit from the conduit.

3,674,249
PNEUMATIC SUSPENSION AXLE RETURN DEVICE

Donald J. McGee, Troy, Mich., assignor to H & H Equipment Company, Detroit, Mich.

Filed July 13, 1970, Ser. No. 54,467
Int. Cl. F16f 1/26
U.S. Cl. 267—52 23 Claims

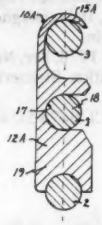


Simple two-part seat block and adjustment mounting plate units, as applied between a transverse wheel axle and each of a pair of parallel, leaf-type spring beams, enable an efficient and expeditious two-way adjustment of the positioning of the beams in relation to the axle, and vice versa, as well as air spring units and axle return devices and/or shock absorbers which are (or may be) associated with the beams and axle. Arcuate seats of the blocks matingly receive the axle adjacent opposite frame sides and, when properly positioned on the adjustment plate in a desired transverse and longitudinal relationship to the axle and beams, are tack welded to the top of the plates and to the bottom of the axle. U-bolts then clamp the axle and seat assemblies to the top of the beam.

3,674,250
SPACER AND STABILIZER FOR INSERTION BETWEEN ADJACENT CONVOLUTIONS OF AN AUTOMOBILE COIL SPRING

Louis Joseph, 225 St. Pauls Ave., Jersey City, N.J.

Filed Sept. 30, 1970, Ser. No. 74,385
Int. Cl. F16f 1/12
U.S. Cl. 267—61 8 Claims

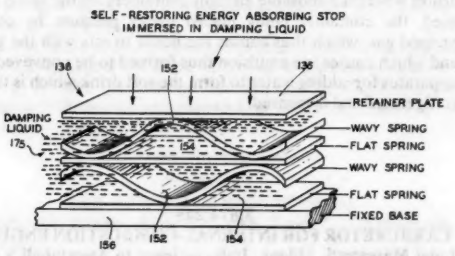


An apparatus for stabilizing the sway of an auto body that is mounted on coil springs by stabilizing the resilient movement of the coil springs and providing, in addition, means to restore the degree of lift of each spring and permit a balanced setting of the auto body, in which spacer blocks are positioned between coils of the spring and further in which each spacer block is extended to be fitted about at least three coils of said spring to retain those coils in alignment.

3,674,251
SELF-RESTORING ENERGY ABSORBING STOP

Benjamin John Tirabassi, Westwood, N.J., assignor to The Bendix Corporation

Division of Ser. No. 792,675, Jan. 21, 1969, Pat. No. 3,582,081. This application May 27, 1970, Ser. No. 41,234
Int. Cl. F16k 1/32
U.S. Cl. 267—162 3 Claims



A self-restoring energy absorbing stop in a free pendulous magnetic azimuth detector mechanism in which the resilient stop serves to limit the motion of the free pendulous mechanism and includes a novel means of providing a viscous damping and rapid spring return in a low volume, high energy absorbing package.

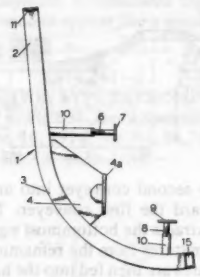
3,674,252
VEHICLE LIFTING DEVICE

Ronald Crabtree, 103 Brunswick House, Crosley Wood Road, and Peter Horacek, 56 Brunswick House, Crosley Wood Road, both of Bingley, Yorkshire, England

Filed Aug. 21, 1970, Ser. No. 65,993
Claims priority, application Great Britain, Sept. 8, 1969, 44,210/69
Int. Cl. B23g 3/18; B66f 7/22
U.S. Cl. 269—55 6 Claims

Vehicle lifting means comprising cradle means including a pair of single or double bearers curved for at least part of their

length and furnished with means for attaching them to the same side of a vehicle, the arrangement being such that with

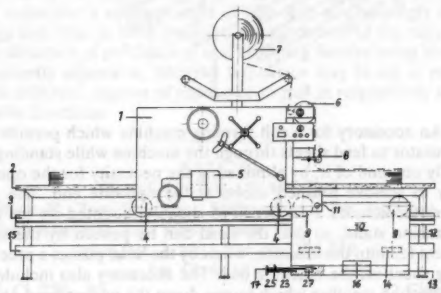


the bearers in position the vehicle can be rolled over and supported on its side.

3,674,253
FOLLOWER APPLIANCE FOR FABRIC FOLDING MACHINES

Gunter Stumpf, Kreis Muensingen, 7421 Mehrstetten, Germany

Filed Dec. 31, 1969, Ser. No. 889,621
Claims priority, application Germany, Nov. 7, 1969, P 19 56 148.9
Int. Cl. B65h *29/46*
U.S. Cl. 270—31 **8 Claims**



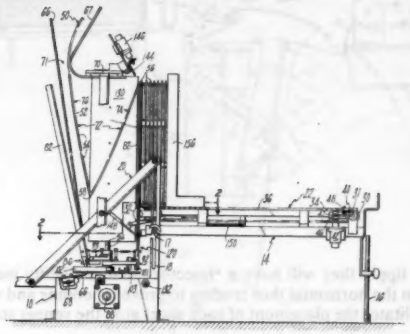
In a fabric folding machine, a service traveler is connected with the movable part of the machine which travels back and forth to perform the folding operation. The movable part is driven by a motor which, in addition to conventional controls that are possibly provided, is also controlled by switches actuated when an operator is standing on the service traveler and/or when the service traveler encounters objects or persons which would otherwise be run down.

3,674,254
METHOD AND APPARATUS FOR FAN-FOLDED STACKING

Archibald H. Welch, Branford, Conn., assignor to Converters Incorporated, Farmington, Conn.

Filed Nov. 25, 1969, Ser. No. 879,804
Int. Cl. B65h *45/20, 45/107*
U.S. Cl. 270—79 **9 Claims**

A method and apparatus for stacking continuous envelopes into a fan-folded stack by longitudinally feeding a precreased continuous envelope sheet downwardly and horizontally feeding successive double leaf sections of the continuous envelope sheet onto a belt conveyor support and with the leaves of the continuous envelope sheet extending normal to the conveyor. A pair of laterally spaced rotary stacking mechanisms, each having two coaxial upstanding eccentrically mounted blades are connected to be driven together for actuating successive double leaf sections of the elongated continuous envelope sheet into folded generally compact association with the

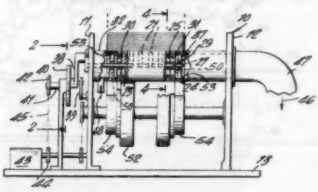


preceding sections of the stack on the conveyor, and such that a pair of the blades are temporarily held at a forward "hold" position to maintain the last sheet section in folded compact association with the stack while the other pair of blades is driven to actuate the succeeding section of the continuous envelope sheet substantially into folded compact association with the stack.

3,674,255
SHEET FEEDING DEVICE

Alvin Arnell, Merrick, N.Y., assignor to Commercial Envelope Manufacturers, Inc., Bronx, N.Y.

Filed Oct. 28, 1970, Ser. No. 84,592
Int. Cl. B65h *3/10*
U.S. Cl. 271—29 **2 Claims**



A high speed sheet feeding device which removes a single sheet of paper from the bottom of a stack by suction means and drives the sheet into transport rollers. Fully mechanical means are employed to substitute a blast of air for the suction means after the sheet has been grasped by the transport rollers. Freed of the influence of the suction means, the sheet is more positively and quickly drawn from the stack without danger of wrinkling, tearing, etc.

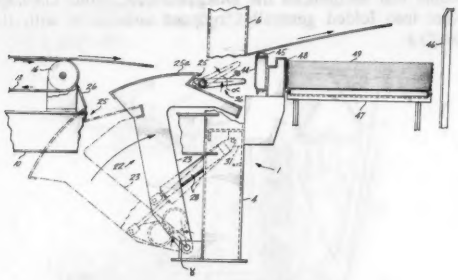
3,674,256
THIN SHEET THROWER

Byron B. Brookhyser, Milton, Wash., assignor to Weyerhaeuser Company, Tacoma, Wash.

Filed March 29, 1971, Ser. No. 128,778
Int. Cl. B65h *29/26*
U.S. Cl. 271—63 **5 Claims**

An apparatus particularly suited for the layup of plywood panels operates to position an individual sheet of veneer over an increasing stack of such veneer sheets. The positioning apparatus consists of a pivoting sheet thrower which is actuated

by a hydraulic cylinder to impart an amount of momentum to the veneer sheet sufficient to throw it outwardly over an upwardly inclined tipple. As the veneer sheets leave the end of



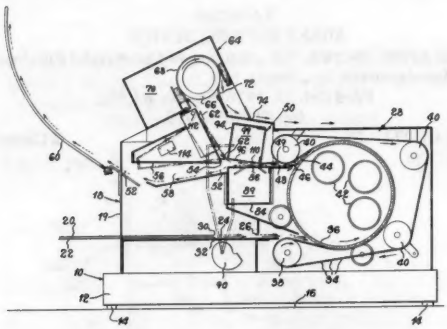
the tipple they will have a trajectory that is slightly inclined from the horizontal thus tending to prevent bending and which facilitates the placement of each sheet atop the veneer stack.

3,674,257

SHEET SEPARATOR FOR COPYING MACHINES

Robert P. Neeb, Wake Forest, and Henry W. Patrick, Raleigh, both of N.C., assignors to Diazit Company Inc., Youngsville, N.C.

Filed Feb. 3, 1971, Ser. No. 112,145
Int. Cl. B65h *29/64*
U.S. Cl. 271—64 **10 Claims**



A sheet separator for separating an original sheet from a juxtaposed copy sheet as the sheets are advanced longitudinally through a copying machine, the sheet separator including means for establishing opposite areas of reduced air pressure, one such area adjacent each sheet, tending to pull the sheets from one another and a plurality of guides for deflecting the juxtaposed sheets from one such area toward the other area at spaced lateral locations such that the sheets are effectively separated.

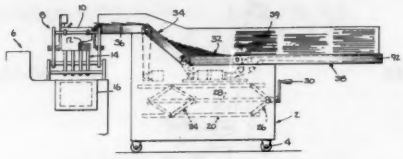
3,674,258

METHOD AND APPARATUS FOR FEEDING STACKED SHEET MATERIAL

Robert E. Maier, Jr., and James R. Moser, both of Easton, Pa., assignors to Harris-Intertype Corporation, Cleveland, Ohio

Filed Oct. 19, 1970, Ser. No. 81,742
Int. Cl. B65h *29/66*
U.S. Cl. 271—77 **12 Claims**

An apparatus which is adapted to operate upon sheet material, such as signatures, arranged in a stack to remove the signatures from the stack and feed them successively into a hopper. A horizontal first conveyer feeds the stack of signatures to a second conveyer inclined upwardly from the first conveyer at a sufficient angle to topple the stack of signatures



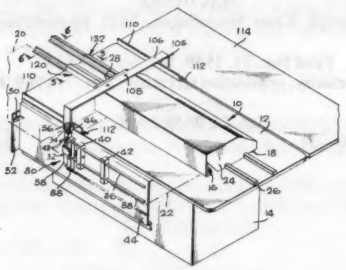
arriving at the second conveyer into an overlapped relation extending toward the first conveyer. The second conveyer successively extracts the bottommost signature in the stack of overlapped signatures from the remaining signatures. The extracted signatures are then fed into the hopper.

3,674,259

PUSHER ACCESSORY FOR ROLL FORMING MACHINE

Steve Budzak, Arleta, Calif., assignor to Marvin Shafer Co., Inc., Los Angeles, Calif.

Filed Dec. 19, 1969, Ser. No. 886,580
Int. Cl. B65h *29/26*
U.S. Cl. 271—84 **9 Claims**



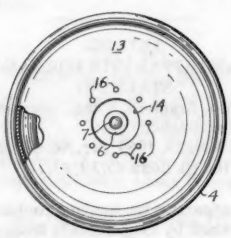
An accessory for a roll forming machine which permits an operator to feed sheets through the machine while standing at only one end of it, by eliminating the necessity for the operator to remove finished sheets at the opposite end. The apparatus includes a pusher head slidably mounted on the roll machine stand, so that the head can be pushed by the next sheet fed into the machine, whereby the head pushes a preceding sheet off the machine bed. The accessory also includes a deflecting member which moves down the pusher head at the end of its forward travel, so that it lies beneath the sheets and therefore a spring can return the head to its initial position.

3,674,260

RIDING CAPSULE AND THE LIKE

Doris V. Loseke, 85-933 Bayview St., Apt. 114, Waianae, Hawaii

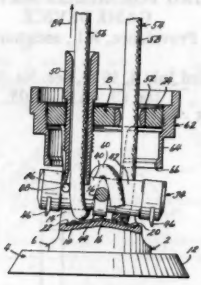
Filed April 23, 1970, Ser. No. 31,221
Int. Cl. A63g *13/00*
U.S. Cl. 272—1 R **1 Claim**



A semi-spherical plaything for children to ride in. It has a chamber to accommodate one or more persons and the bot-

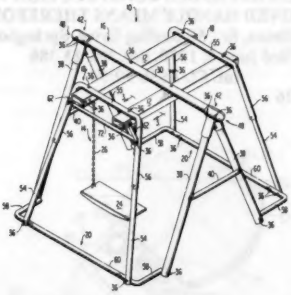
tom is curved so that it can be rollicked along a reasonably smooth surface. The bottom thereof is adapted to be placed into the saddle portion of a wheeled dolly and thus it can be pushed about by a playmate. A removable top is provided so that the plaything is made to appear like a space capsule.

3,674,261
PULL ROPE FRICTION TYPE EXERCISING DEVICE
Charles C. Krug, 607 E. Fifth St., Lee's Summit, Mo.
Filed Dec. 16, 1970, Ser. No. 98,744
Int. Cl. A63b 21/00
U.S. Cl. 272—79 A **9 Claims**



A pull rope exercising device including a rope extending in longitudinally running relation through a body member whereby a user may pull on either end thereof to effect said longitudinal movement, a pair of frictional clamping devices carried by said body member and operable by pulling tension on respectively opposite ends of said rope to clampingly engage said rope to resist yieldably the movement of the rope in the direction of pull, each of said clamping devices being independently adjustable, whereby the device may be set to provide different degrees of resistance to pull in respectively opposite directions.

3,674,262
PLAYGROUND APPARATUS
William R. Tomalinas, Jr., Wilkes-Barre, Pa., assignor to Roth-American, Inc., Wilkes-Barre, Pa.
Filed Dec. 3, 1971, Ser. No. 204,519
Int. Cl. A63f 7/06
U.S. Cl. 272—85 **11 Claims**

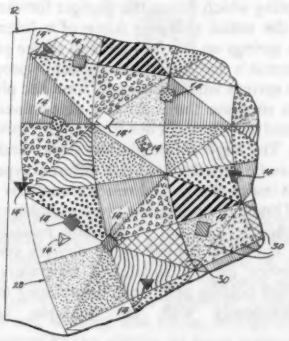


A swing frame assembly including a swing frame support assembly supporting elongate tracks. Trolleys are movably supported by the tracks and a swing is pivotally suspended by the trolleys. Included in the support assembly are an intermediate support assembly and end stabilizing assemblies, each of which is provided with direct ground engaging members. Braces interconnect these members. A lift bar is disposed in the path of travel of the mounting for the swing.

3,674,263
GAME STICK AND METHOD OF MANIPULATING IT
Antonio R. Villanueva, Oak Park, Mich., assignor to Holvy Wren, St. Clair Shores, Mich., a part interest
Filed Aug. 24, 1970, Ser. No. 66,286
Int. Cl. A63f 9/00
U.S. Cl. 273—1 R **10 Claims**

A game stick having an off-center handle member with slightly concave opposing surfaces and exhibiting an axial mass unbalance accomplished by the off-center location of the handle member. The stick is engaged with the outside surface of one's thumb and the thumb is moved in a closed looping trajectory to maintain the engagement without actually grasping the stick between one's fingers.

3,674,264
MATCHING GAME APPARATUS
Ethel Boercker, 10144 Cabot St., St. Louis, Mo.
Filed July 7, 1969, Ser. No. 839,258
Int. Cl. A63f 3/00
U.S. Cl. 273—1 R **6 Claims**



A game apparatus which is entertaining and has educational values for improving muscular and visual coordination and requires skill and dexterity including a game board having a plurality of different distinctive areas thereon, and a plurality of objects having distinctive surface characteristics matching certain of the distinctive areas of the game board for distributing randomly on the game board so that the player or players of the game can compete by attempting to pick up as fast as possible only those objects that are on areas of the game board having similar matching distinctive characteristics. A timer is provided to determine the time period during which a player's performance can be measured, and scoring members bearing

distinctive characteristics identical to the characteristics of the playing pieces are provided for award to the players removing the most playing pieces of each distinctive characteristic during each playing period.

3,674,265

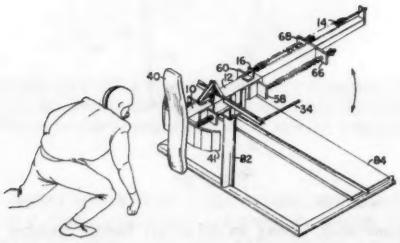
FOOTBALL BLOCKING AND TACKLING SLED

Harry L. Sheets, P.O. Box 607, and Robert W. Booth, P.O. Box 622, both of Farwell, Tex.

Continuation-in-part of Ser. No. 749,450, Aug. 1, 1968, abandoned. This application June 3, 1970, Ser. No. 42,931

Int. Cl. A63b *67/00*

U.S. Cl. 273—55 R **16 Claims**



A mechanical training device which simulates the initial charge and retreat reactions of a football lineman. The lineman's body is simulated by a pad of resilient material which is coupled via a first set of compression springs to the forward end of a plunger which is slideable within a hollow guide sleeve between an extended and a retracted position. An expansion spring urges the plunger toward its extended position and opposes motion toward its retracted position. A latch mechanism holds the plunger in its retracted position until it is unlatched for forward motion toward its extended position. The forward motion of the plunger is resiliently limited by a second set of compression springs and the rearward motion is resiliently limited by a third set of compression springs. The expansion spring which drives the plunger forward is selected to simulate the initial charging force of a lineman and the compression springs on the forward end of the plunger simulate the lineman's natural shock-rebound properties. The compression springs which resiliently limit the plunger's rearward motion simulate the lineman's determined attempt to hold his ground after he switches from an offensive to a defensive posture. The angle of the plunger stroke and the force of the springs can be varied to simulate different types of linemen and different initial charge and retreat reactions. For training a plurality of linemen simultaneously, a plurality of devices are connected together so that a common release mechanism releases the latch mechanism of all devices simultaneously, but each device can be re-latched separately by its own lineman. A ball holding and "snap" simulating means is actuated simultaneously with the common latch release mechanism.

3,674,266

DOUBLE-ENDED BALL PADDLE

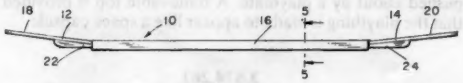
Sam Grosberg, Brooklyn, N.Y., assignor to Friedman and Goodman, Brooklyn, N.Y.

Filed March 5, 1970, Ser. No. 16,899

Int. Cl. A63b *59/00*

U.S. Cl. 273—73 R **3 Claims**

A paddle for striking a ball having two striking members connected to opposite ends of a handle. Each striking member extends outwardly from the handle with a striking surface of each striking member being angularly disposed with respect to the longitudinal axis of the handle, so that each striking surface faces inwardly. The handle has a rectangular cross-section to indicate the orientation of the striking surfaces to the user of the paddle.



3,674,267

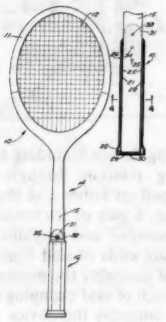
ADJUSTABLE GRIP FOR AN ELONGATED HANDLE OF A GAME DEVICE

James E. Hollis, Providence, R.I., assignor to Bancroft Racket Company

Filed July 8, 1970, Ser. No. 53,090

Int. Cl. A63b *49/08*

U.S. Cl. 273—75 **2 Claims**



A grip for the elongated handle of a game device, such as a racket or golf club, which may be interchanged with other grips to provide different hand engaging diameters, all of the grips telescopingly fitting the shank of the handle on which it is assembled, the grip being positioned on the shank in various positions lengthwise of the shank to vary the effective length of the handle.

3,674,268

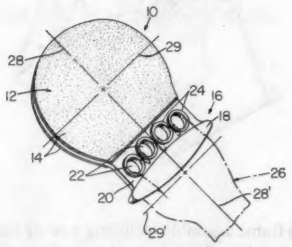
TABLE TENNIS PADDLE CONSTRUCTION WITH IMPROVED HANDLE MEANS THEREFOR

Kenneth S. Shellman, Sr., 55 Kesling Drive, Springboro, Ohio

Filed June 4, 1970, Ser. No. 43,386

Int. Cl. A63b *59/04*

U.S. Cl. 273—76 **1 Claim**



A table tennis paddle having a hand graspable portion, a ball striking portion and a connecting portion extending between and integrally interconnecting the former two portions in coplanar relation. The longitudinal and lateral axes of the ball striking portion are substantially coplanar and parallel

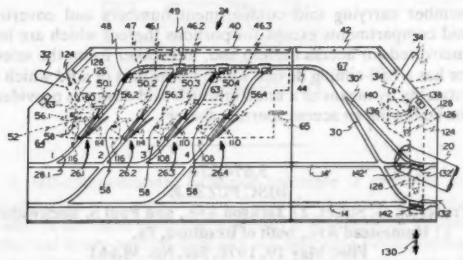
with the longitudinal and lateral axes of the hand graspable portion respectively. A plurality of apertures are formed in the connecting portion for receiving the fingers of a player. The hand graspable portion has mounted thereon thickening members to be readily graspable within the player's palm.

3,674,269

APPARATUS FOR STARTING AND TERMINATING A TOY VEHICLE RACE

Julius Cooper, New Hyde Park, and Edwin A. Nielsen, Oceanside, both of N.Y., assignors to Ideal Toy Corporation, Hollis, N.Y.

Filed Jan. 7, 1971, Ser. No. 104,697
Int. Cl. A63f 9/14
U.S. Cl. 273—86 R **4 Claims**



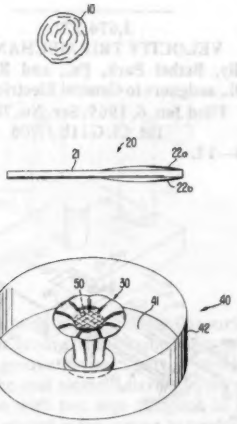
An apparatus is described for starting and terminating a race between toy vehicles traveling over a toy track. A start-finish track section is provided with vehicle stalls which are successively arranged to receive arriving vehicles at the end of a race. Stall selectors are employed which are operated in sequence at the end of the race to divert the arriving vehicles into successive stalls in the order of vehicle arrival at the start-finish track section. The vehicle stalls are provided with vehicle retaining devices which are controllable at the start of the race to release selected vehicles retained by the stalls.

3,674,270

BASKET GAME UTILIZING CONVEXLY SHAPED PADDLES AND AN IRREGULARLY SHAPED BALL

Thaer L. Benjamin, 723 Menlo Ave. Apt. 1, Menlo Park, Calif., and Carole A. Reynolds, 630 Masonic Way, Apt. J., Belmont, Calif.

Filed May 20, 1971, Ser. No. 145,423
Int. Cl. A63b 63/00
U.S. Cl. 273—101 **6 Claims**



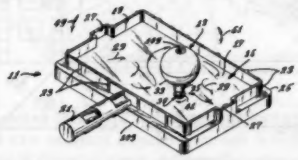
A game of chance uses a randomly-shaped ball, paddles with two surfaces possessing continuously varying radii of curvature and a petal-shaped basket. The object is to strike the ball so that it enters, and stays in, the basket. The random shapes of the ball and paddles lend great unpredictability to the game and guarantee that each participant obtains a great deal of exercise.

3,674,271

REVERSIBLE SURFACE TRAY ASSEMBLY FOR A TOY TOP

Jacob De Gelder; Albert R. Baginski, and Anthony D. Miller, all of Torrance, Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed March 9, 1970, Ser. No. 17,546
Int. Cl. A63b 67/14
U.S. Cl. 273—115 **9 Claims**



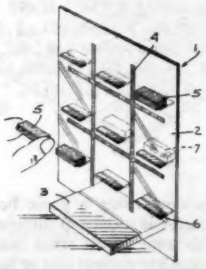
A peripherally walled two-sided tray with accessory holding portions and an extending handle, is adapted to hold replaceable accessory inserts with different surface configurations requiring different degrees and types of skill and for amusement with spinning toy tops. The inserts may include a maze, a ramp-jump configuration, a magic slate arrangement, a plurality of spinning discs and others.

3,674,272

MAGNETIC BOARD GAME APPARATUS

Ferdinand J. Wszalek, 606 Nichols St., Utica, N.Y.

Filed Nov. 23, 1970, Ser. No. 91,929
Int. Cl. A63f 3/00
U.S. Cl. 273—130 A **4 Claims**



A game is disclosed including a transparent game board and magnetized playing pieces. The game board is mounted vertically for play with a tic-tac-toe design visible on the two opposite faces of the transparent board. Supports are provided on both board surfaces within the pattern to receive the magnetized pieces and winning and losing combinations of the pieces are arranged by the players on these supports with the players' skill plus a random choice of the magnetic polarity of the pieces as played determining the outcome of the game.

3,674,273

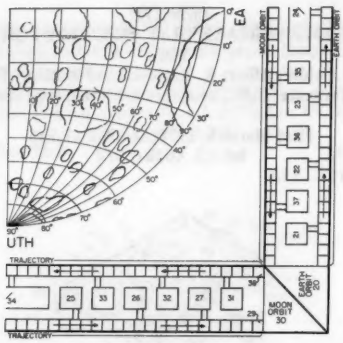
BOARD GAME APPARATUS

Bertram C. Sells, 339 Huntington Lane, Elmhurst, Ill.

Filed April 15, 1970, Ser. No. 28,884
Int. Cl. A63f 3/04
U.S. Cl. 273—134 AA **4 Claims**

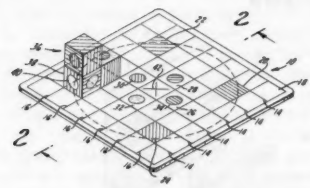
A game based on space flight and extraterrestrial exploration. A game board having a map of an extraterrestrial body featuring latitude and longitude markings thereon and paths

inscribed on the board represent a space flight from earth to the extraterrestrial body represented on the map. Specially marked cards and dice determine place and movement of playing pieces on and over the game board, while a spinner



device is utilized by each player to select by chance the latitude and longitude of an individual initial goal. A special slide device used by each player indicates the approximate time for placement of each player's playing piece into initial play on the board.

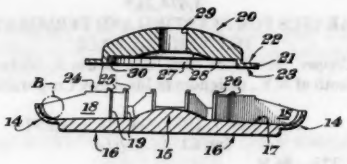
3,674,274
BOARD GAME APPARATUS
Barbara Ellen Schur, 70-31 108th St., Forest Hills, N.Y.
Filed Jan. 13, 1971, Ser. No. 106,058
Int. Cl. A63f 3/00
U.S. Cl. 273—135 AC **1 Claim**



A game apparatus comprising a game board and game pieces. The game board has a flat top surface divided into a plurality of areas with some of the areas bearing distinctive colors. The game pieces are cubical and at least some of the game pieces have faces with colors thereon corresponding to those on the distinctive areas. Each of the remaining faces of the game pieces has a color corresponding to that on at least one other game piece face. The game is played by a number of players who alternately place game pieces on the board and try to register the colors on the faces of their game piece with those of previously placed game piece faces and/or board distinctive areas.

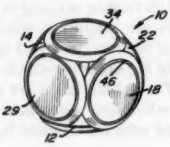
3,674,275
RANDOM NUMBER SELECTOR
Julie Marie Samson, Brighton, England, assignor to Subbuteo Sports Games Limited, Tunbridge Wells, Kent, England
Filed May 1, 1970, Ser. No. 33,628
Claims priority, application Great Britain, June 5, 1969, 28,550/69
Int. Cl. A63b 71/00
U.S. Cl. 273—138 R **9 Claims**

A random number selector having a base which presents a plurality of compartments each of which is associated, permanently or alterably, with a number unique thereto and whose entrances face a deflector (domed or pyramidal) whose function is to deflect a ball dropped onto said deflector into one of the compartments in order to "select" the number associated with that compartment. In one form, the selector has a ball-aiming device which forms a part of a removable



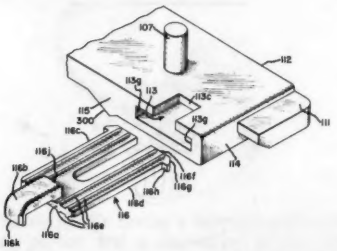
member carrying said compartment numbers and covering said compartments except for portions thereof which are left uncovered for access thereto and, in another form, the selector has a ball-aiming device which forms part of a lid which is rotatable by means of a knob in which said device is provided, the lid having an access aperture therein.

3,674,276
DISC PUZZLE
Frederick G. Street, 27 Jackson Ave., and Paul S. Buckwalter, 11 Homestead Ave., both of Bradford, Pa.
Filed May 19, 1970, Ser. No. 38,661
Int. Cl. A63f 9/06
U.S. Cl. 273—157 R **4 Claims**



Six dish-shaped members have their marginal edges interleaved at spaced peripheral points to form the sides of a cube unit. A circular rib is formed in each member and engages the edges of underlying bounding members to resist slippage during assembly of the unit. In other embodiments an odd plurality of cutouts extend inwardly from the marginal edge. During construction of the cube unit, a coin or medal may be enclosed therein to make a rattle-like device. When the cube unit is dropped, the interleaved members fly apart with a clatter.

3,674,277
VELOCITY TRIP MECHANISM
Jack L. Kelly, Bethel Park, Pa., and Ronald K. Wiandt, Decatur, Ill., assignors to General Electric Company
Filed Jan. 6, 1969, Ser. No. 789,174
Int. Cl. G11b 17/06
U.S. Cl. 274—1 L **3 Claims**



In a miniature record player for reproducing diminutive records, there is provided a bifurcated tone arm, on the under-

side of which is formed a transverse slot. A U-shaped element is snapped into removable cooperation with the slot and slides therein to provide a velocity trip mechanism for the player.

3,674,278

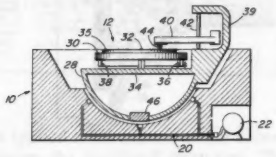
COMPENSATED PHONOGRAPH TURNTABLE

William R. Bowerman, 2457 Jasu Drive, Lawrence, Kans.

Filed Dec. 21, 1970, Ser. No. 99,995

Int. Cl. G11b *3/60*

U.S. Cl. 274—39 A **4 Claims**



A self-compensating, balanced turntable is provided for record players to maintain the turntable in a true horizontal plane. A turntable-tone arm assembly is formed with a hemispherical lower portion disposed in a matching hemispherical cavity formed in a fixed base. Air under low pressure is delivered between the base cavity and the hemispherical portion to form an air bearing therebetween. The table-tone arm assembly is weighted in such a fashion that the turntable surface will assume a horizontal attitude regardless of the attitude of the base. In a modification an anti-skating control is provided to move the centering weight automatically to compensate for imperfections in record playback using a conventional tone arm.

3,674,279

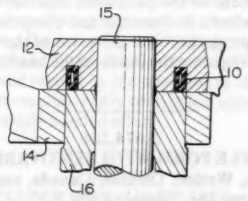
CONSTANT PRESSURE SEAL

Mitchell McMurray, Peoria; Eugene A. Plouzek, Washington, and James R. Sturges, Metamora, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Continuation of Ser. No. 738,519, June 20, 1968, abandoned. This application Oct. 26, 1970, Ser. No. 84,179

Int. Cl. F16j *15/34*

U.S. Cl. 277—95 **6 Claims**



A seal between two relatively rotatable flat surfaces one of which has an annular groove, there being an annular resilient seal element in the groove having a part in contact with the other flat surface, the seal element having a more or less V-shaped cross section with two legs designed to be brought together upon being placed in the groove to produce a tubular resilient member to insure a light faceload at the area of sealing and a relatively constant spring rate.

3,674,280

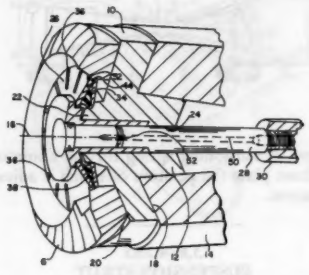
SELF-CLEANING CHUCK

Harry Pedersen, Rochester, N.Y., assignor to The Gleason Works, Rochester, N.Y.

Filed Dec. 16, 1970, Ser. No. 98,511

Int. Cl. B23b *31/40*

U.S. Cl. 279—2 **15 Claims**



A self-cleaning chuck for ring gears or like workpieces having at least one resilient annular member which expands to grip the bore of the workpiece. An annular groove is formed in the working-gripping outer circumference of the arbor, and air under pressure is delivered to the annular groove and between the arbor and the chuck body to keep the chuck free of contaminators, such as lapping compound, applied to the workpiece as it is being lapped, cut or tested. In addition, in the particular embodiment disclosed herein the arbor comprises a pair of resilient and oppositely dished annular members, and the outer circumference of the arbor member is designed to grip the workpiece generally along two lines of contact substantially coincident with the respective outermost peripheries of the external surfaces of the two dished member. A safety device for detecting workpieces having over-sized bores is included in the chuck mechanism.

3,674,281

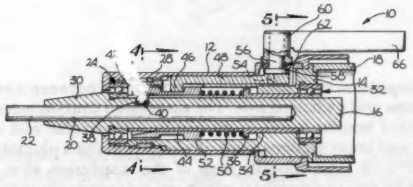
TOOL CHUCK ASSEMBLY

John R. Hedrick, La Crescenta, Calif., assignor to Pevrick Engineering Co., Inc., Sun Valley, Calif.

Filed Jan. 21, 1971, Ser. No. 108,466

Int. Cl. B23b *31/10*

U.S. Cl. 279—30 **8 Claims**



A tool chuck assembly to firmly retain the cylindrical stem of a tool wherein a plurality of ball elements are frictionally pressed against the stem by a wedge shaped sleeve, the sleeve being movable into and out of engagement with the balls by means of a manually actuatable lever.

3,674,282

PNEUMATIC STABILIZING SYSTEM FOR VEHICLES

Antonin Stoklasek, 82 First St., Perth Amboy, N.J.

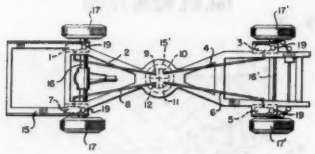
Filed Sept. 4, 1970, Ser. No. 69,849

Int. Cl. B60g *7/00*

U.S. Cl. 280—124 F **5 Claims**

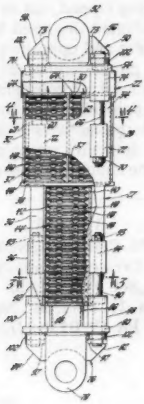
The stabilizing system comprises four resilient air filled bellows suspending the car body on the wheels and a stabilizing bellow unit containing four separate bellow sections mutually

connected on a common spring-loaded plate. Each bellow section is pneumatically connected to an assigned suspension bel-



low by a pipe. A tensioning spring for the common plate is seated on a base plate the position of which is adjusted by an adjustment screw.

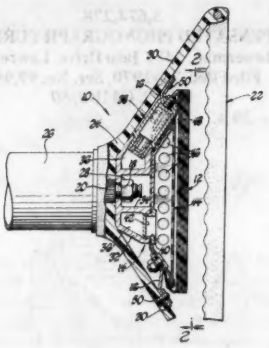
3,674,283
SUSPENSION STRUT
Frank R. Jellison, Canton; John B. Mason, Hudson, both of Ohio, and Terry K. McQueen, Princeton, Ind., assignors to General Motors Corporation, Detroit, Mich.
Filed Nov. 24, 1970, Ser. No. 92,420
Int. Cl. B60g 11/24
U.S. Cl. 280—124 R **3 Claims**



A suspension strut adapted to be connected between a vehicle frame and a wheeled axle. The suspension strut includes an elongated housing which is divided by a transverse wall into upper and lower sections, each of which contains a plurality of rubber pads. The opposite ends of the suspension strut are closed by end cap members which are independently adjustable for preloading the strut and are movable relative to the housing in a longitudinal direction for causing the rubber pads to be alternately compressed and expanded.

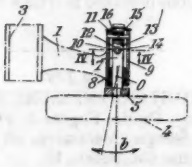
3,674,284
VEHICLE SAFETY ASSEMBLY
Thomas E. Lohr, Warren, Mich., assignor to Allied Chemical Corporation, New York, N.Y.
Filed Oct. 21, 1970, Ser. No. 82,563
Int. Cl. B60r 21/08
U.S. Cl. 280—150 AB **5 Claims**

A vehicle safety assembly including an inflatable bag which is attached to a cup-shaped member defining an annular chamber. A diffuser is disposed within the bag and a gas generator is in communication with the annular chamber in the cup-shaped member. The cup-shaped member has a hole centrally thereof for receiving the steering shaft and a pair of brackets interconnect the diffuser and the spokes of the steer-



ing wheel whereby the assembly may be associated with conventional steering assemblies.

3,674,285
VEHICLE SUSPENSION
Albert Grosseau, Chaville, France, assignor to Citroen S.A. (Automobiles Citroen, Berliet, Panhard), Paris, France
Filed July 8, 1969, Ser. No. 839,947
Claims priority, application France, July 9, 1969, 69158551
Int. Cl. B60g 3/14
U.S. Cl. 280—124 R **4 Claims**

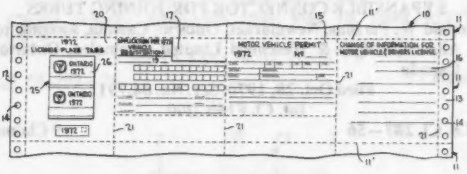


A suspension for a vehicle, which suspension includes a pendulum member upon which the wheel of the vehicle is mounted and which, in turn, is connected to a vertically oscillating suspension element on a pivot arranged transversely lower than the axis of the wheel. A stop is provided between the suspension element and the pendulum member to limit angular displacement of the pendulum member about its pivot, the stop being elastic in character and comprised of a material having elastic properties with the pivot of the suspension element being arranged on the inside of the bearing comprised by the elastic stop.

3,674,286
MULTIPLE FORM WITH REMOVABLE TABS
Hugh Dodgson, Weston, Ontario, Canada, assignor to Moore Business Forms, Inc., Niagara Falls, N.Y.
Filed Dec. 7, 1970, Ser. No. 95,724
Int. Cl. B42d 1/00, 11/00
U.S. Cl. 281—2 **1 Claim**

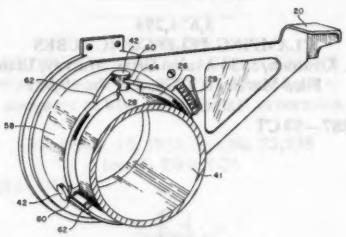
The invention in its illustrative or suggestive embodiment comprises a series of multiple forms connected in continuous web style with feed holes along at least one side margin. Each multiple form is divided longitudinally of the web, by tear perforations, into a plurality of separate unit form areas, adapted to bear a common identifying indicia. One of said areas, possibly an end one, carries a relatively small paper slip having one surface secured to the area by means of an adhesive of

sufficient tenacity to carry it through the treating or printing procedure but removable from the area by stripping the slip therefrom. To this paper slip is removable secured a label or tab of durable material and coated with a pressure-sensitive adhesive such as for securement to a licence plate of a motor car. The outer surface of the paper slip is treated so that the adhesive on the tab will not permanently adhere thereto and the tab can be removed from its temporary adhesion when



ready to be applied to the plate, but will adhere sufficiently to the web during the imprinted operation. The paper slip is preferably divided into two parts by a serrated line of division to facilitate the separation of the tab by bending, whereby one part can be removed and the corresponding area of the tab applied to the license plate, while the operator grasps the other part of the tab while it is still covered by the other part of the divided strip, so that the pressure-sensitive adhesive will not be damaged by contact by the fingers.

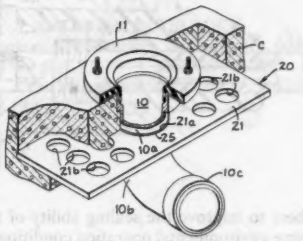
3,674,287
SIMPLIFIED MOUNTING ARRANGEMENT
Wilbur-Webb Selley, Maitland, Fla., assignor to Vactronics Incorporated, Olando, Fla.
Filed Dec. 23, 1969, Ser. No. 887,553
Int. Cl. A47l *9/24*
U.S. Cl. 285—7 **7 Claims**



A simplified and highly effective mounting arrangement for the cleaning head or other component of a vacuum cleaner or the like, involving the use of interfitting, generally cylindrically shaped members, which arrangement enables the head to be quickly removed merely by the application of foot pressure on a lever, and thereafter easily reinstalled upon the vacuum cleaner with but single handed effort.

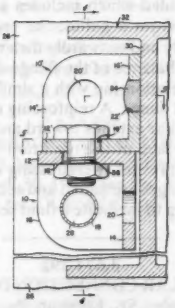
3,674,288
CLOSET BEND STABILIZER
Billy W. Babb, Campbell, Calif., assignor to Robert R. Walker, Jr., San Jose, Calif.
Filed April 20, 1970, Ser. No. 29,955
Int. Cl. F16l *35/00*
U.S. Cl. 285—24 **4 Claims**

A closet bend stabilizer that receives the closet bend and is embedded into a cement slab surrounding the closet bend. The closet bend stabilizer serves to reduce the movement of the closet bend installed in the opening of the cement slab. Toward this end, the closet bend stabilizer comprises a horizontally disposed plate formed with a central opening of suitable dimension to receive the closet bend. In addition, the stabilizer includes a plurality of reduced diameter openings on each side of the central opening to improve its fixed relation



within the cement slab. Below the horizontal plate and surrounding the central opening is a tapered flange to facilitate the stabilizer receiving the closet bend. The stabilizer is sealed or caused to adhere to the closet bend by a suitable adhesive.

3,674,289
TRI-HEDRAL CLIP FOR STEEL CONSTRUCTION
Francis R. Geraci, Crofton, Md., assignor to Ger-Bro Corporation, Glen Burnie, Md.
Filed May 20, 1969, Ser. No. 826,247
Int. Cl. F16b *7/00*
U.S. Cl. 287—189.36 B **2 Claims**

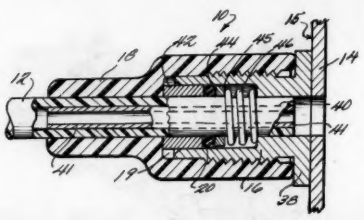


Tri-hedral clips having three symmetrical sides in right angular relationship to each other and having identically positioned openings through each side for ready attachment by plug welding or bolts to metallic building units and to each other to provide temporary support for one building component with respect to another for welding together. The clips also have utility as permanent structural units in a variety of applications.

3,674,290
COUPLING
Sellers B. McNally, Homewood, Ill., assignor to Maremont Corporation, Chicago, Ill.
Filed May 4, 1970, Ser. No. 34,099
Int. Cl. F16l *33/18*
U.S. Cl. 285—248 **7 Claims**

A coupling for use in attaching flexible tubing to suspension elements or other devices in which the tubing is reinforced by

a rigid member which prevents collapse of the tubing and in which a seal is resiliently compressed between two relatively



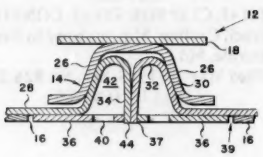
rigid members to improve the sealing ability of the coupling under extreme environmental operation conditions.

3,674,291

FLANGE FOR CONDUIT COUPLING

Leonard Z. Goldberg, Canoga Park, Calif., assignor to Lockheed Aircraft Corporation, Burbank, Calif.

Filed Nov. 30, 1970, Ser. No. 93,796
Int. Cl. F16l *19/00*
U.S. Cl. 285—367 **10 Claims**



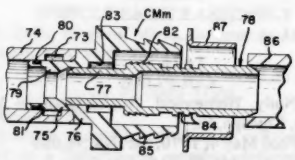
A flange is provided which includes a divergent-reentrant portion extending from a collar, the reentrant segment depending in an axially and outwardly distended spring relationship relative to the balance of the flange and being adapted to mate in a sealing relationship with a similar segment upon an adjacently oriented flange. A reinforcing ring fixed to an inner periphery of the collar extends toward and into close proximity with a rearward face of the reentrant segment for engagement therewith to prevent overstressing of the reentrant segment. Two such flanges are mated and secured in their relative positions by a clamp to facilitate a fluid seal.

3,674,292

TUBULAR CONNECTION DEVICES

Henry William Demler, Sr., Lebanon, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. Nos. 755,410, Aug. 26, 1968, abandoned, Ser. No. 710,946, March 6, 1968, abandoned, Ser. No. 676,583, Oct. 19, 1967, abandoned, Ser. No. 587,944, Oct. 18, 1966, abandoned, which is a continuation-in-part of Ser. No. 517,747, Dec. 30, 1965, Pat. No. 3,378,282. This application Oct. 15, 1969, Ser. No. 866,631
Int. Cl. F16l *33/22, 47/00*
U.S. Cl. 285—174 **7 Claims**



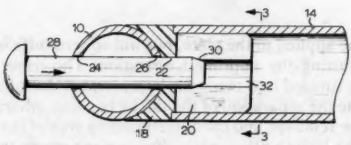
A tubular connection device for connection to an end of a tubular member comprises a tubular body member and into which the end of the tubular member is disposed, the tubular body member having an outer surface and a ferrule member being axially movable along the body member causing the body member under the ferrule member to be decreased in diameter into tight and sealing engagement with the tubular member. The outer surface and the ferrule member are provided with tool-engaging areas for moving the ferrule member into position on the body member.

3,674,293

EXPANSIBLE CONNECTOR FOR JOINING TUBES

Ronald W. Parsons, Newmarket, Ontario, Canada, assignor to Allcock, Laight & Westwood Limited, Bramalea, Ontario, Canada

Filed Oct. 28, 1970, Ser. No. 84,791
Int. Cl. F16b *7/00*
U.S. Cl. 287—56 **9 Claims**



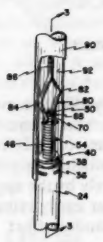
A connector for joining a first elongated tube and a second tube having a hollow end portion at an angle to the first tube includes an integral body having a saddle to engage the outer surface of the first tube and a split pin portion resiliently deflectable relative to the saddle. The split pin has a passageway extending to the longitudinal length thereof in communication with an opening in the saddle portion. The split pin is forced apart to engage and grip the inside surface of the hollow end portion of the second tube upon receiving an elongated pin through the opening in the saddle into the passageway.

3,674,294

CLAMPING TELESCOPIC TUBES

Arthur J. Kirkham, 5534 Avalon Drive, Murray, Utah

Filed March 16, 1970, Ser. No. 19,581
Int. Cl. F16b *7/14*
U.S. Cl. 287—58 CT **8 Claims**



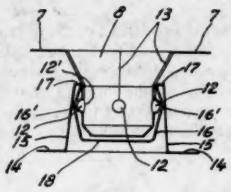
Clamping method and apparatus for an outer tube and an inner tube telescopically disposed within the outer tube, the apparatus being normally concealed from view and having a threaded coupling member mounted in one end of the inner tube, an anti-rotate loop carried by the coupling member and an expandable lock which opens against the inside surface of the outer tube and closes in response to axial displacement of the threaded coupling member. The anti-rotate loop firmly contacts the interior surface of the outer tube and is displaceable over the surface along the axis of the outer tube. Relative rotation of the inner and outer tubes causes the anti-rotate loop to bind against the inside surface of the outer tube to

rotate the threaded coupling member relative to the inner tube thereby spreading the lock tightly against the inside surface of outer tube until further rotation of tubes as well as relative axial displacement are prevented.

3,674,295
PRESSURE OPERATED FASTENING MEANS FOR CONTAINERS

Pietro Padovani, Via A. Berardi 22, Chievo, Verona, Italy

Filed May 8, 1970, Ser. No. 35,664
Claims priority, application Italy, May 10, 1969, 61237 A/69
Int. Cl. E05c *19/02, 19/06*
U.S. Cl. 292—76 **9 Claims**

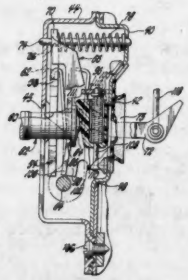


A pressure operated fastening means for container comprising hinged male and female halves, the male half comprising a cylindrical stub chamfered at its end portion and provided with hemispherical projections, which may be hollow or in the form of solid spherical pips, positioned generally midway between the head and the foot of the stub. The female half includes a circular ring of relatively greater thickness than the adjoining lateral wall, with insertion of the male half during fastening subjecting the projections to compression by the circular ring, with the projections upon further insertion forcing the relatively thinner lateral wall inwardly to effect the desired fastening.

3,674,296
CLOSURE DOVETAIL ARRANGEMENT

Bert R. Wanlass, and Alfonsas Velavicius, both of Warren, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Sept. 16, 1970, Ser. No. 72,735
Int. Cl. E05c *3/26*
U.S. Cl. 292—216 **3 Claims**

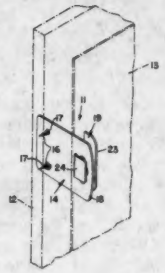


A dovetail arrangement for a closure panel movable in a generally vertical path between open and closed positions with respect to a vehicle body opening, the dovetail arrangement including, on the vehicle body, a retainer and a vertically sliding wedge member and further including, on the closure panel, an elongated striker having a shank with an enlarged tapered head on one end thereof. In the closed position of the closure panel the retainer engages the striker under the enlarged head and the wedge member engages the striker on the taper of the enlarged head thereby cooperating with the retainer to capture the striker and prevent substantially all bodily shiftable relative movement between the closure panel and the vehicle body longitudinally of the closure panel.

3,674,297
INTERIOR DOOR LOCK

Donald B. Hawkins, P.O. Box 221, San Leandro, Calif.

Filed Jan. 21, 1971, Ser. No. 108,319
Int. Cl. E05c *19/00*
U.S. Cl. 292—252 **5 Claims**

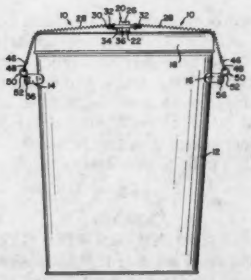


An extremely simple yet tamperproof lock including a plate member adapted for securance to a door jamb and a latch member movable away and towards the plate member. In the extended position of the latch member a door hinged to the jamb may not be swung inwardly since it will engage the latch member. The lock further includes a ball which must be raised and permitted to enter a ball receiving portion of the plate member in order to permit return of the latch member to its retracted inoperative position. When the latch member is moved outwardly into its locking or operative position, the ball gravitally falls downwardly and prevents return of the latch member until the ball is manually raised.

3,674,298
GARBAGE CAN LID LOCK

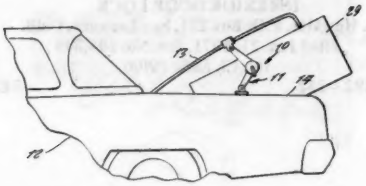
Balazs Vekony, Rte. 3, Box 4064 Signal Cove, Port Richey, Fla.

Filed Oct. 30, 1970, Ser. No. 85,467
Int. Cl. B65d *45/30*
U.S. Cl. 292—258 **6 Claims**



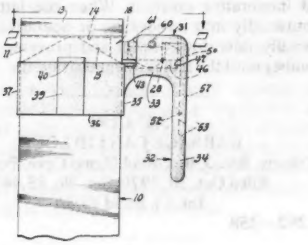
A garbage or trash can lid lock is disclosed wherein a pair of diametrically opposed hold-down springs each have upper ends which are attached to a conventional handle-equipped lid. The hold-down springs extend in opposite directions over the rim of the trash can lid and are releasably attached to the handle on the side of the trash can so that the lid is held tightly to the trash can even if the can is tipped over.

3,674,299
ADJUSTABLE TRUNK LID HOLDER
Raymond E. Kelley, 8021 N. W. 181st St., Hialeah, Fla.
Filed Dec. 4, 1970, Ser. No. 95,106
Int. Cl. E05c 17/04
U.S. Cl. 292—262 1 Claim



A device for stationarily securing a passenger car trunk lid at a partly opened position so to permit transportation of large objects that normally cannot be enclosed within the trunk compartment, the device comprising an adjustable arm assembly, comprised of a pair of arms attached pivotly together at their one ends and which can be rigidly secured at a desired angle, and the opposite ends of the arms each having an adjustable clamp one of which is secured to an edge of the trunk lid and the other of which is attached to the edge of the trunk compartment opening.

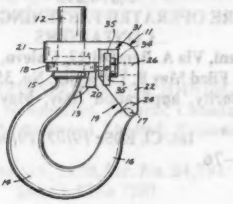
3,674,300
CAM OPERATED DETACHABLE CARTON HANDLE
James B. Simms, 8441 Birch Road, Taylor, Mich.
Filed May 4, 1970, Ser. No. 34,310
Int. Cl. A47j 45/10
U.S. Cl. 294—31.2 3 Claims



A cam operated detachable carton handle for use on milk cartons and the like, and which includes an integral rectangular housing adapted to be slidably mounted over the upper end of a carton. A handle is integrally formed on the housing. A plunger is slidably mounted on the handle and a pivotally mounted cam is provided for camming the plunger into a recess in the upper end of the carton for retaining the rectangular housing and handle in place on the carton.

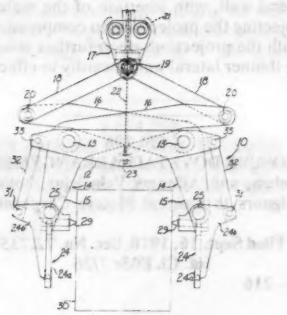
3,674,301
HOOK AND COLLAR WITH GATE
Edward J. Crook, Jr., Fort Wayne, Ind., assignor to America Hoist & Derrick Company, St. Paul, Minn.
Filed Jan. 7, 1971, Ser. No. 104,611
Int. Cl. B66c 1/36
U.S. Cl. 294—82 8 Claims

A load handling hook has a cylindrical shank and an integral hook body portion. This body portion includes an integral outward projection and an integral shoulder adjacent the shank. A collar is supported on the shoulder and around the shank and includes fingers which extend over the projection to prevent rotation of the collar. A safety gate includes a hub rotatably mounted around the shank and on the collar and also includes a bridging arm integral with the hub and situated to be rotatable with the hub between bridging and clearing relation with the throat of the hook. An outward extension of the hub provides a housing for a locking plunger which is



spring biased to slide through an opening in the hub and into an opening in the collar to affix the hub in latching, rotation preventing relationship to the collar when the arm is in bridging relationship to the hook throat. The plunger is manually slidable against the spring action to unlatched relationship with the collar to allow rotation of the hub and arm.

3,674,302
INGOT AND MOLD HANDLING TONGS
Robert Douglas Mutch, Niagara Falls, Ontario, Canada, assignor to Dominion Bridge Company Limited, Montreal, Quebec, Canada
Filed Feb. 23, 1971, Ser. No. 118,102
Claims priority, application Canada, Dec. 10, 1970, 100,341
Int. Cl. B66c 1/50
U.S. Cl. 294—118 8 Claims

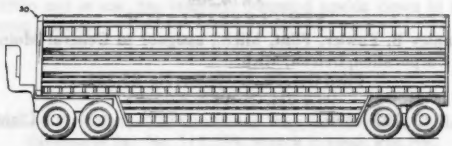


A pair of bell cranks pivoted to a support member provide a pair of crossed upper arms for suspension from a crane hook, and a pair of transversely spaced lower arms equipped with opposing jaws. The jaws are provided with sockets and with bits to selectively engage lifting lugs of an ingot mold with the sockets, or to grip an ingot with the bits. An actuating line connected to the support member moves the arms toward or away from each other, and parallel motion links between the support member and the jaws maintain a constant angular attitude of the sockets and bits throughout the range of movement of the arms.

3,674,303
LIVESTOCK TRAILER
Wendell M. Doonan, and Ronald E. Knobloch, Great Bend, Kans., assignors to Doonan Truck & Equipment, Inc., Great Bend, Kans.
Filed April 10, 1970, Ser. No. 27,220
Int. Cl. B60r 5/00
U.S. Cl. 296—24 C 10 Claims

A drop-center livestock trailer having a plurality of top swinging gates between the rear and upper compartments.

Each gate has a pair of plunger locks operated with a common bar and provided with lost motion linkage to insure positive latching of one plunger even if the other plunger is obstructed. A ramp swings downwardly from the rear edge of the upper deck of the trailer for loading from the rear deck into the upper deck. The ramp swings into an upright position behind



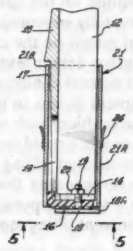
the gates for positively securing the latter and a chute covered with vertically swinging deck doors permits loading from the rear compartment to the lower compartment. Air operated power means swings a wall of the front compartment to lower a ramp for loading forwardly from the upper compartment and shock absorber means is provided for cushioning the impact of the swinging of gates between compartments.

3,674,304

RELEASABLE AUTOMATIC FASTENER FOR A TRUCK STAKE AND LIKE

Raymond W. Swanson, 14515 Cornishcrest Road, Whittier, Calif.

Filed Jan. 2, 1970, Ser. No. 211
Int. Cl. B60p *7/06*
U.S. Cl. 296—43 **7 Claims**



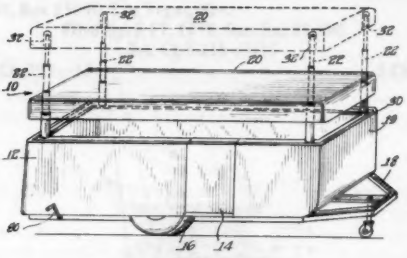
For a combination of a stake with an elongated exposed section and, as a pertinent member, a relatively shorter end section, and, as another pertinent member, a receptacle for said end section,—an automatic fastener for the stake end section in the receptacle which fastener requires a substantially instantaneous double and forceful action in two different directions for removing the automatically fastened stake from the receptacle and comprises a sidewise exposed edge in one of said two pertinent members, a sidewise protruding clutching means secured with the other of said two pertinent members for engaging against said edge when therebelow and pushed sidewise thereagainst, an outwardly resilient normally sidewise protruding compressible means secured with one of said two pertinent members for being resiliently compressed when within the receptacle for pushing said clutching means sidewise against said edge automatically when said end section is within said receptacle and the clutching means is below said edge while the compressible means remains substantially compressed, a means for removing the clutching means from the edge and, therewhile, the stake from the receptacle by farther compressing the compressible means with overcoming contra side pressure applied against the elongated exposed section of the stake and by therewhile pulling the latter from the receptacle.

3,674,305

CAMPER TYPE VEHICLE AND DRIVE ASSEMBLY FOR RAISING THE TOP THEREOF

Virgil H. Steury, 924 E. Lincoln Ave., Goshen, Ind.

Filed Aug. 13, 1970, Ser. No. 63,420
Int. Cl. B60p *3/34*
U.S. Cl. 296—27 **14 Claims**



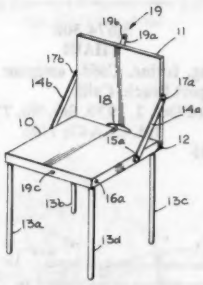
A mobile type housing such as a trailer or camper having a base and retractable top is disclosed herein. The housing includes a plurality of telescopically movable support members mounted to the base and supporting the top for movement between a retracted or lowered position while in transit and an extended or raised position while in use. A single drive assembly is mounted to the base and connected to all of the support members through a plurality of elongated flexible pushrods for moving the support members equal distances and in unison so as to raise the top in a smooth, even and reliable manner.

3,674,306

COMPACT FOLDING CHAIR

Richard H. Botney, 13343 Debby St., Van Nuys, Calif.

Filed Oct. 8, 1970, Ser. No. 79,137
Int. Cl. A47c *4/10*
U.S. Cl. 297—17 **1 Claim**



This invention provides a highly compact folding chair that can approximately be reduced to the size and form of an attache case. In essence, the seat resembles a card table whose legs can be folded into its underside and a hinged backrest is provided that also is used to cover or enclose the legs, thereby forming a box-like structure in the hollow of which the legs are contained. The hinge itself includes a handle for easy carrying.

3,674,307

SAFETY SEATS FOR AUTOMOBILES AND AIRCRAFT

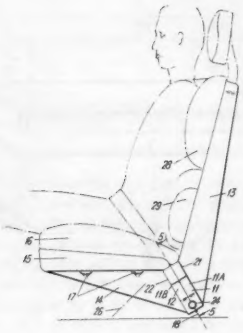
Ernest Baker Dove, Basildon, England, assignor to Teleflex Products Limited, Basildon Essex, England

Filed Oct. 31, 1969, Ser. No. 872,899

Claims priority, application Great Britain, Oct. 31, 1968, 51,556/68

Int. Cl. A47c *3/00*; B60r *21/10*

U.S. Cl. 297—284 **4 Claims**



A vehicle seat, especially for automobiles or aircraft, is provided which has a seat frame possessing a configuration akin to the human spine and hip formation. At the rear of the seat base there is a hip frame having lateral wings and providing the main attachment point of the seat in the vehicle. Forward and upward from this hip frame there extend a base spine and a back spine respectively, the base spine carrying integral therewith a seat pan supporting a seat cushion while the back spine, which widens toward the top, supports a fixed shoulder cushion, an adjustable lumbar cushion, and, if desired an adjustable head rest. The seat frame structure is fabricated in pressed sheet steel, the hip frame being a box-type fabrication built up from two half-pressings one integral with the back spine and the other with the base spine. The ends of the hip frame wings provide anchorage points for the straps of a safety harness. A harness retraction reel, which may be an inertia reel, is mounted on the back spine to receive a diagonal or breast strap of the harness passing over the seat occupant's shoulder and down into the seat back.

3,674,308

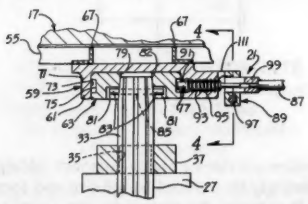
CHAIR

Jason D. Radding, Irvine, Calif., assignor to Crown Imports Co., Inc., Newport Beach, Calif.

Filed Oct. 2, 1970, Ser. No. 77,667

Int. Cl. A47c *1/06*

U.S. Cl. 297—345 **8 Claims**



A chair comprising a base, a support shaft mounted on the base and a body supporting portion mounted on the support shaft. The support shaft is fixed against rotation relative to the base and can move generally vertically relative to the base. The body supporting portion moves vertically with the support shaft and is rotatable relative to the support shaft. A locking mechanism is carried by the body supporting portion for releasably locking the body supporting portion in a preselected angular position relative to the support shaft.

3,674,309

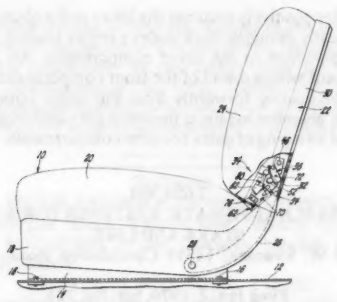
VEHICLE SEAT LATCH

Stanley B. Fowler, Flint, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 30, 1970, Ser. No. 85,381

Int. Cl. A47c *3/00*

U.S. Cl. 297—379 **2 Claims**



A latch for a vehicle seat structure having a cushion base member and a tiltable cushion back member, the latch including a striker rigidly mounted on the cushion base member, a bifurcated latch bolt pivotally mounted on the cushion back member, fixed abutment means on the cushion back member, and an inertially responsive detent lever pivotally supported on the latch bolt. When normal conditions prevail, the detent lever bypasses the abutment means to permit free movement of the latch bolt and the cushion back member. When abnormal conditions prevail, as when rapid deceleration of the vehicle induces inertially motivated tilting of the cushion back member, the detent lever engages the abutment means to retain the latch bolt in a latching position wherein the latter captures the striker to prevent tilting movement of the cushion back member.

3,674,310

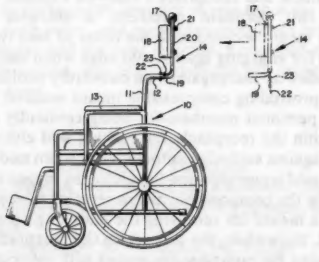
HEAD REST ATTACHMENT FOR WHEEL CHAIRS

Anthony Montagano, 45 Eastview Ave., Pleasantville, N.Y.

Filed Sept. 28, 1970, Ser. No. 75,985

Int. Cl. A47c *7/38*

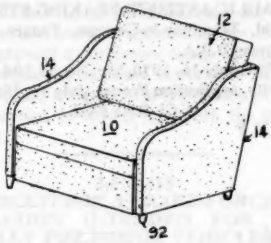
U.S. Cl. 297—397 **10 Claims**



The attachment is composed of a tubular frame which includes two laterally spaced upstanding legs having a bridging

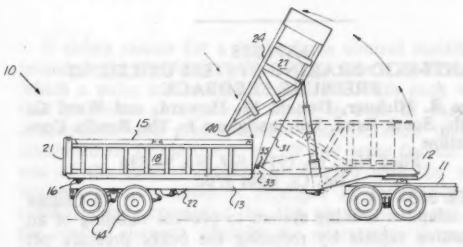
portion or member joining their upper ends. A cushion is secured to said legs with its upper edge spaced below the bridging member whence the latter serves as a hand grip. The lower ends of the legs have mutually parallel extensions from the same side of the frame as that on which the cushion is mounted. Such extensions are insertible into the tubular handles of the chair. When the headrest is in use the frame extends upward from the common plan e of the chair handles. When not in use, the frame is mounted upside down in the same manner.

3,674,311
CHAIR CONSTRUCTION
Richard H. Miller, 4723 Crestwood Way, Sacramento, Calif.
Division of Ser. No. 711,259, March 7, 1968, Pat. No. 3,526,433. This application Feb. 26, 1970, Ser. No. 18,019
Int. Cl. A47c 7/00, 1/12, 7/02
U.S. Cl. 297—440 **2 Claims**



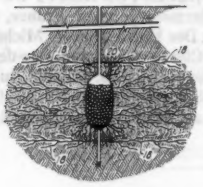
A seat, such as an upholstered chair, sofa or love seat, is so constructed that it can be shipped in a flat package, knocked down, and assembled by the purchaser in a very few minutes. The seat has a back, two arms and seat which are assembled by connecting the back to the seat and then by ingenious means connecting the two arms to the back and seat. The upper ends of the arms have hook engagement with cooperating means on the edges of the back, whereupon the seat is bolted to the arms to complete the assembly. The seat construction employs conventional sinuous springs extending from front to back and the seat deck construction is such that longer springs may be used, connected in close proximity to the front and back of the seat deck and at relatively low points to improve the comfort of the seat by spring action. Tension means connected to the springs prevents the "bucketing" of the springs, the tensioning means being variable to control such action.

3,674,312
DOUBLE BOX DUMP TRAILER
Cecil N. O'Rear, 1118 Claiborne Ave., Minden, La.
Filed July 17, 1970, Ser. No. 55,648
Int. Cl. B60p 1/16
U.S. Cl. 298—8 T **6 Claims**



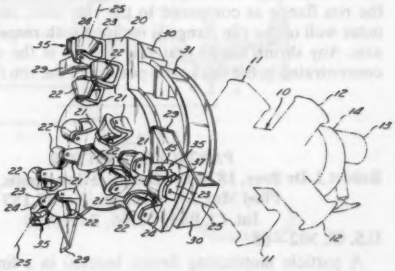
A double box dump trailer in which a relatively long rear box is mounted on the trailer for dumping with a hydraulic mechanism. A somewhat smaller forward box is mounted on the trailer for dumping into the rear box with a hydraulic mechanism. The forward box is provided with an upwardly sloping dumping chute which overlies the rear box when the front box is raised to its fullest extent.

3,674,313
METHOD FOR EFFECTING DIRECTIONAL NUCLEAR FRACTURING
Carroll F. Knutson, and Charles Robert Boardman, both of P.O. Box 15090, Las Vegas, Nev.
Filed April 17, 1970, Ser. No. 29,590
Int. Cl. E21b 43/26
U.S. Cl. 299—13 **5 Claims**



A method for localizing and directing energy from an underground nuclear explosion which includes the steps of providing an acoustical blocking zone on at least one side of the contemplated explosion situs to limit transmission of elastic waves to the earth on the opposite sides of the acoustical blocking zone, then detonating the nuclear explosive at the situs. The acoustical blocking zone is a zone of material which is at variance in its acoustical characteristics with respect to the adjacent earth in which it is located.

3,674,314
GAGE SCRAPER
Joseph V. Scaravilli, Cleveland Heights, Ohio, assignor to Jarva, Inc., Solon, Ohio
Filed Jan. 7, 1970, Ser. No. 1,079
Int. Cl. E01g 3/04
U.S. Cl. 299—86 **17 Claims**



A tunneling machine is disclosed which includes a support frame, a rotatable cutter head, and inside roller cutters and

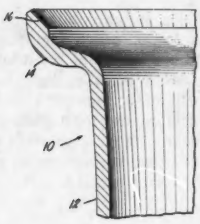
gage roller cutters for cutting or crushing the end face of a tunnel. Each gage cutter is provided with a gage scraper which includes a first scraper portion for engaging the tunnel end face and a second scraper portion for engaging the cylindrical tunnel wall to clear protruding formation particles from the path of the gage cutter. A resilient mounting means resiliently biases the first and second scraper portions against their respective tunnel surfaces to provide substantially continuous contact therewith as the scraper portions become worn, and to permit retraction of the scraper portions if they encounter a formation particle which they cannot remove. A guide plate prevents movement of the resiliently mounted scraper portions toward the gage cutters in the direction of travel of the gage cutters around the tunnel end face to permit mounting the scraper portions on gage saddles immediately adjacent the gage cutters. Intersecting edge portions of the guide plate form fixed scrapers for further protection of the gage cutters.

3,674,315

CAST STEEL WHEELS FOR HEAVY-DUTY VEHICLES

Daniel Lejeune, Clermont-Ferrand, France, assignor to Compagnie Generale Des Etablissements Michelin raison sociale Michelin & Cie, Clermont-Ferrand, Puy-de-Dome, France

Continuation-in-part of Ser. No. 648,397, June 23, 1967, Pat. No. 3,530,927. This application April 1, 1970, Ser. No. 24,601
Claims priority, application France, June 24, 1966, 66940
Int. Cl. B60b *3/06*
U.S. Cl. 301—65 **4 Claims**



A vehicle wheel is made of cast steel and has a thickness of steel small with respect to its diameter. The steel has a carbon content within the range of 0.16 to 0.70 percent, a manganese content within the range of 0 to 1.60 percent, and a silicon content within the range of 0 to 1.00 percent. The tensile strength of the steel is within the range of 40 kg/mm² to 80 kg/mm², and the steel is hardened through about 10 to 20 percent of its thickness. The thickness of the steel is increased in the rim flange as compared to the rim base, and the axially outer wall of the rim flange is inclined with respect to the rim axis. Any shrink marks that may appear in the cast steel are concentrated in the thickened portion of the rim flange.

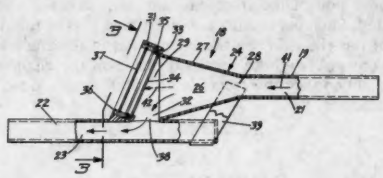
3,674,316

PARTICLE MONITOR

Robert J. De Brey, 1830 E. 42nd St., Minneapolis, Minn.

Filed May 14, 1970, Ser. No. 37,157
Int. Cl. B65g *53/66;* **B47l** *9/00*
U.S. Cl. 302—65 **13 Claims**

A particle monitoring device located in a line carrying a moving fluid, as air, containing particles. The device has a particle sensing member providing signals that are in direct proportion to the amount of particles in the moving fluid. The sensing member can be a flexible cover enclosing the large end of a housing having a side wall that increases in diameter as a function of distance from its inlet, as a funnel-shaped housing. Particles that hit the cover produce an audio signal



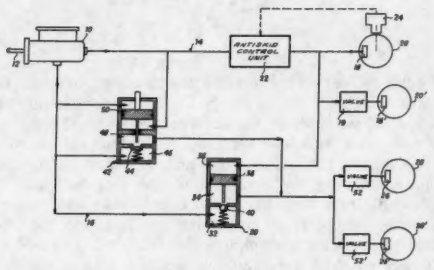
providing information feedback of the amount of particles in the moving fluid.

3,674,317

HYDRAULIC ANTISKID BRAKING SYSTEM

James Mangold, Tremblay-le-Gonesse, France, assignor to Societe Anonyme D.B.A.

Filed July 16, 1970, Ser. No. 55,504
Claims priority, application France, July 31, 1969, 6926216
Int. Cl. B60t *8/00*
U.S. Cl. 303—21 F **6 Claims**



A vehicle antiskid braking system comprising a hydraulic pressure control source adapted to supply two independent braking circuits with two separate hydraulic braking pressures respectively, an antiskid control unit adapted to modulate the first braking pressure to the hydraulic brake actuators of a first set of wheels as a function of the skidding of at least one wheel of said first set, a modulator unit adapted to modulate the second braking pressure to the hydraulic brake actuators of a second set of wheels as a function of the braking pressure in said first set of wheel brake actuators and a normally closed by-pass valve unit to by-pass said modulator unit for directly connecting said control source to said second set of wheel brake actuators, upon a failure in said first braking circuit.

3,674,318

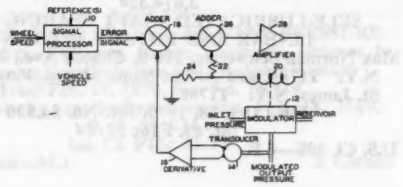
ANTI-SKID BRAKING SYSTEM UTILIZING PRESSURE FEEDBACK

George B. Hickner, Donald W. Howard, and Ward C. Suttle, South Bend, Ind., assignors to The Bendix Corporation

Filed Nov. 18, 1970, Ser. No. 90,536
Int. Cl. B60t *8/06*
U.S. Cl. 303—21 A **12 Claims**

An adaptive braking system to prevent skidding of an automotive vehicle by reducing the brake pressure yet maintaining near maximum braking torque. A transducer measures the brake pressure to provide an additional input to control logic already including inputs from wheel speed

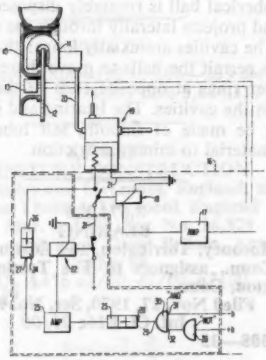
sensors and a vehicle acceleration sensor or vehicle speed sensor. The maximum pressure on each cycle is memorized and a percentage value used to insure that on the next cycle the pressure build will not be prematurely terminated. A derivative of the brake pressure is used to change a first set point in accordance with pressure application rates. The first set point activates the anti-skid system. A noise detector that senses changes in wheel acceleration will prevent a premature decay of braking pressure caused by rough road surfaces. A variable frequency clock is used to provide a signal of a frequency proportional to wheel acceleration to slowly approach the point of maximum torque.



3,674,319
SAFETY CIRCUIT FOR A BRAKE-FORCE CONTROL INSTALLATION INTENDED FOR VEHICLES, ESPECIALLY FOR MOTOR VEHICLES

Franz Brugger and Jurgen Paul, Stuttgart, Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany

Filed Dec. 11, 1970, Ser. No. 97,244
Claims priority, application Germany, Dec. 12, 1969, P 19 62 322.4
Int. Cl. B60t *8/06*
U.S. Cl. 303—21 CG **15 Claims**

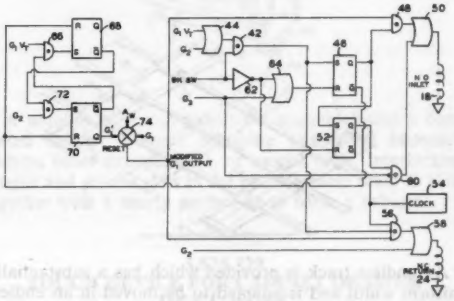


A safety circuit for a brake force control installation intended for vehicles, particularly motor vehicles, in which a pulse transmitter is associated with each wheel that produces at least one signal in case of excessive deceleration and predetermined reacceleration that are combined in an electronic circuit and serve for the control of the control elements associated with the wheel brakes; a safety relay is arranged in series with the control relay, controlled by the electronic circuit, for the control element, whereby the safety relay is normally closed when de-energized and opens up when energized; the control of the safety relay takes place by way of two timing elements, whereby the first timing element is controllable by way of the control of the corresponding control element itself while the second timing element is controlled by a pulse that results from the electronic combination of the deceleration and reacceleration signals, the response time of the two timing elements is greater than the longest normally occurring control period.

3,674,320
ADAPTIVE BRAKING CONTROL SYSTEM

Donald W. Howard and George B. Hickner, South Bend, Ind., assignors to The Bendix Corporation

Filed July 15, 1970, Ser. No. 54,941
Int. Cl. B60t *8/12*
U.S. Cl. 303—21 P **15 Claims**

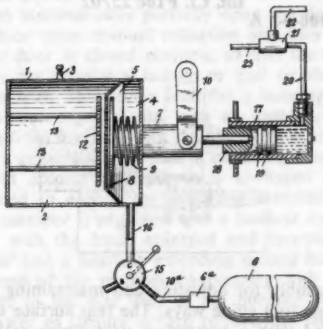


An adaptive braking system on an automotive vehicle for controlling brake pressure. From a signal that represents angular velocity of the wheels, a control unit generates a signal that represents wheel acceleration or deceleration. If the deceleration exceeds certain values or the acceleration exceeds a given value, the control logic will vary the brake pressure to give multiple build and decay rates of pressure in the wheel cylinder.

3,674,321
CAPTIVE AIR BRAKE FOR VEHICLES

John Garfield Fontaine, 2817 NE. 26th Court, Fort Lauderdale, Fla. 33306

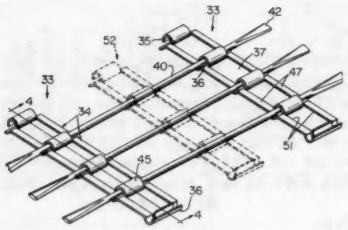
Filed June 29, 1970, Ser. No. 50,538
Int. Cl. B60t *13/28, 15/20*
U.S. Cl. 303—28 **6 Claims**



A brake system consisting of an embodiment in which a brake-applying mechanism is normally maintained in a position of brake application by means of captive air pressure and in which brake release is attained by counter

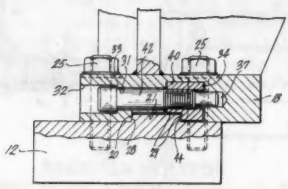
air pressure of greater force than the captive air pressure. Another embodiment involves the use of vacuum from the intake manifold of a vehicle motor or by the use of a vacuum tank and a one-way check valve, the vacuum creating a force greater than the force of the captive air, to thereby cause brake release.

3,674,322
ENDLESS TRACK
Walter E. Huber, Springfield, Mo., assignor to Dayco Corporation, Dayton, Ohio
Filed July 9, 1970, Ser. No. 53,608
Int. Cl. B62d *55/24*
U.S. Cl. 305—38 **12 Claims**



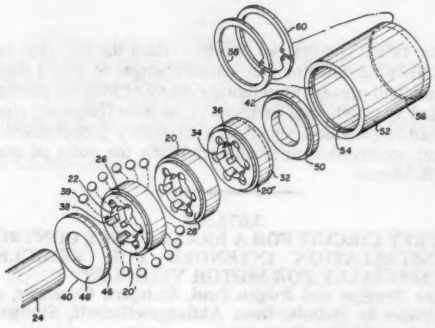
An endless track is provided which has a substantially uniform width and is adapted to be moved in an endless path. The track is comprised of an elastomeric material and has at least one endless chain embedded within a band-like body which has a ground engaging surface and each endless chain is defined by a plurality of links having opposed interlocking end portions with each link having an opening therein which is adapted to receive therethrough an associated tooth of a drive sprocket used to drive the track. A plurality of reinforcing members are provided and each reinforcing member is fixed to an associated link and extends across the full width of the track whereby the reinforcing members provide optimum lateral stability for the track yet assure flexibility during movement thereof in its endless path.

3,674,323
MACHINE TOOL GUIDE WAY RESTRAINT
Frank Zankl and Earl R. Lobneis, Milwaukee, Wis., assignor to Kearney & Trecker Corporation, West Allis, Wis.
Filed Dec. 4, 1970, Ser. No. 95,262
Int. Cl. F16c *25/02*
U.S. Cl. 308—3 A **4 Claims**



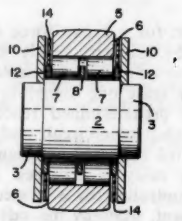
An assembly for adjusting and maintaining alignment of machine tool guide ways. The rear surface of the way is provided with a protruding strip which extends along the length of the way. The machine tool support is provided with a complementary channel for receiving the strip. One surface of the channel forms a locating surface and all positioning of the guide way is against this surface. The positioning of the guide way against the locating surface is effected by the use of a plurality of plugs located within the machine tool support, each plug having a hole for receiving a screw. When the screw is tightened against the machine tool support, it draws the plug against the edge of the strip to force its opposite end against the locating surface.

3,674,324
SELF-LUBRICATED SHAFT BEARING FOR LINEAR AND ROTARY MOTION
Max Norman Schweizer, 110 S. Clinton Ave., Bay Shore, N.Y. 11706, and Arthur Stone Moran, Parsens Lane, St. James, N.Y. 11780
Filed Oct. 28, 1970, Ser. No. 84,838
Int. Cl. F16c *31/04*
U.S. Cl. 308—6 R **11 Claims**



A ball bearing assembly for linear and rotatable motion having one or more flat annular bearing cages having a central passage to receive a shaft. Each bearing cage has a plurality of circumferentially spaced cylindrical cavities extending axially of the ring from opposite ends and each cavity has a lateral opening into the central passage. A spherical ball is rotatably disposed in each of the cavities and projects laterally through the opening into the passage. The cavities are axially longer than the diameters of balls to permit the balls to move therein axially of the ring. Spacer rings at opposite ends of the assembly hold the balls in the cavities. The bearing and spacer rings and balls may be made of smooth, self lubricating fiberous polymer material to minimize friction.

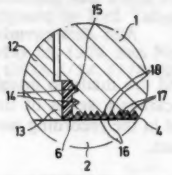
3,674,325
BEARING
John J. Moroney, Torrington, and Edwin B. Tharp, Prospect, Conn., assignors to The Torrington Company, Torrington, Conn.
Filed Nov. 27, 1970, Ser. No. 93,186
Int. Cl. F16c *21/00*
U.S. Cl. 308—35 **3 Claims**



A roller bearing including concentric inner and outer races with a series of rollers located therebetween and

end plates mounted on each end of the inner race and extending over the end faces of the outer race. A self-lubricating washer is disposed between each end plate, the adjacent end race of the outer race and the ends of the rollers and a spacer washer is provided to prevent the ends of the rollers from wearing away the self-lubricating washer.

3,674,326
SHAFT BEARING SEALED AGAINST PRESSURE
Rudolf Kaiser, Ettlingen, Baden, Germany, assignor to Neue Argus Gesellschaft m.b.H., Baden, Germany
Filed Feb. 17, 1970, Ser. No. 11,979
Claims priority, application Germany, Feb. 18, 1969, P 19 08 074.1
Int. Cl. F16c *33/74*
U.S. Cl. 308—36.1 **2 Claims**

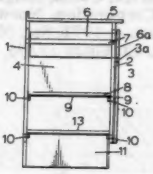


Pressure sealed shaft bearing for passing shafts through walls that separate areas which are under different pressures, where the wall passage for the shaft is knurled or its surface is treated in an equivalent manner and a bearing sleeve of thin walled suitable plastic is provided which is calibrated or grooved into the hole in the wall, and where the material of the grooved in sleeve (4) of plastic material penetrates into the recesses (17) in the inner surface of the hole while not completely filling them because capillary spaces (18) are formed in the deepest recesses, and where the plastic sleeve is provided with a sealing flange at the outside of the wall (1) that faces the low pressure which rests against a shoulder defined by an annular recess (7) in the wall.

ERRATA

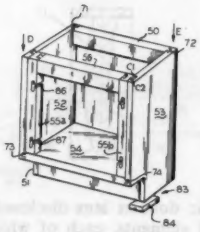
For Classes 308—122 to 308—233 see:
Patent Nos. 3,674,355 thru 3,674,357

3,674,327
FURNITURE CONSTRUCTION
George Henry Robinson, Liverpool, England, assignor to Hygena Limited, Liverpool, England
Filed Mar. 4, 1970, Ser. No. 16,329
Claims priority, application Great Britain, Apr. 4, 1969, 17,155/69
Int. Cl. A47b *43/00, 47/00, 87/00*
U.S. Cl. 312—257 **2 Claims**



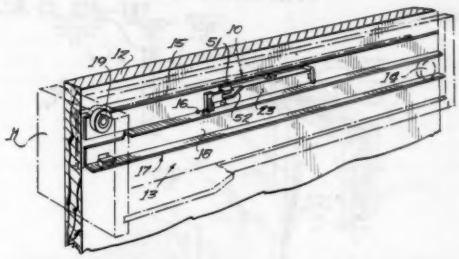
The invention resides in a set of parts for assembling into an article of furniture, and an article of furniture so constructed. The set of parts comprises a front component, a back component, tie bars for connecting said front and back components in spaced relationship, grooves in said front and back components, and end panels for being received and located in said grooves.

3,674,328
SLIPJOINTED KNOCKDOWN CABINET
Kenneth N. White, 12650 90th Ave., Palos Park, Ill. 60464, and Harold E. Meyer, 82nd Ave. and Forestview Drive, Orland Park, Ill. 60462
Filed Dec. 10, 1970, Ser. No. 96,682
Int. Cl. A47b *47/00*
U.S. Cl. 312—263 **5 Claims**



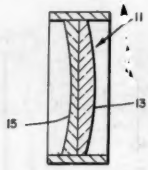
A number of precut panels are assembled into a completed cabinet without requiring any glue, fasteners, clamps, other strengtheners, or special tools. Interlocking tongue and groove slots in the panels enable them to slide together with a nearly perfect fit to form a cabinet.

3,674,329
TOUCH DEVICE FOR CABINET DRAWER OR CLOSURE
John M. Schill, Kitchener, Ontario, Canada, assignor to Keystone Consolidated Industries, Inc., Peoria, Ill.
Filed Dec. 16, 1970, Ser. No. 98,494
Int. Cl. A47b *88/00, 95/00*
U.S. Cl. 312—319 **11 Claims**



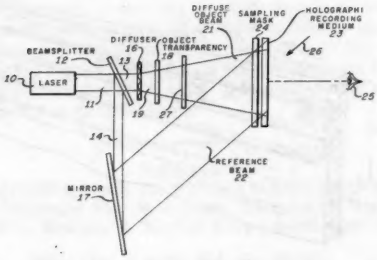
A touch device for cabinet drawers or closures which will act to automatically partially open the drawer, closure or door upon manual actuation and may latch the drawer or door in closed position, so that the drawer or door does not require a handle or pull on the exterior surface thereof. The device includes a housing mounted in the cabinet or enclosure with an elongated plunger projecting from one end, with the inner end of the plunger engaging a generally reciprocable actuating member having limited arcuate movement. A U-shaped pusher is spring-biased to engage the actuating member, and the actuating member is provided with a hook at one end cooperating with the inner enlarged and recessed end of the plunger and a laterally extending second hook at the opposite end of the member cooperating with an opening formed in the side wall of the housing. Movement of the drawer or closure inward retracts the plunger and causes the actuating member to engage the housing and plunger to prevent outward movement thereof, and pressure exerted on the closed drawer or closure causes release of the actuating member so that the spring biases the plunger outwardly to partially open the drawer or closure.

3,674,330
ACHROMATIC DOUBLET LENS FOR INFRARED RADIATION
John D. Strong, 5 Chadwick Court, Echo Hill, Amherst, Mass. 01002
Filed Jan. 22, 1971, Ser. No. 108,937
Int. Cl. G02b *1/02, 13/14*
U.S. Cl. 350—2 **11 Claims**



The achromatic doublet lens disclosed herein employs a pair of optical elements, each of which is constructed of a respective infrared transparent alkali halide. By appropriately selecting the two alkali halides in accordance with the teachings of the present invention, the resulting doublet is caused to be substantially achromatic over a useful range of wavelengths, rather than just at a pair of preselected wavelengths as would be the case if the two infrared transparent materials were arbitrarily selected.

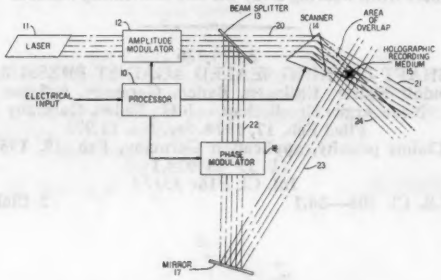
3,674,331
SPACE DIVISION MULTIPLEXED HOLOGRAPHIC APPARATUS
Henry John Caulfield, Carlisle, Mass., assignor to Sperry Rand Corporation
Filed Oct. 9, 1970, Ser. No. 79,412
Int. Cl. G02b *27/00*
U.S. Cl. 350—3.5 **1 Claim**



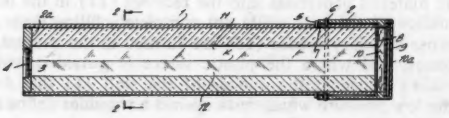
Holographic apparatus including a plurality of spatially complementary sampling masks for space division multiplexing respective object signals in such a way that each recording is distributed throughout substantially the full area of the holographic storage medium. Individual masks are used for successively recording the various objects and the mask corresponding to a particular recording is used in playback apparatus for producing respective images of said objects.

3,674,332
HOLOGRAM GENERATOR USING SUPERPOSITION OF PLANE WAVES
Herwig Werner Kogelnik, Fair Haven, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Nov. 23, 1970, Ser. No. 91,909
Int. Cl. G01d *9/42;* **G02b** *27/00*
U.S. Cl. 350—3.5 **7 Claims**

A system which generates holograms from electrical signals superimposes a series of light waves in a thick hologram recording medium. A processor determines the amplitude, phase, and angle of incidence of the series of light waves needed to generate the hologram from the electrical signal. These light waves are then generated with amplitude modulation, phase modulation, and deflection devices, and are made to interfere with reference light waves. This causes a series of interference patterns to be superimposed in the recording medium, thereby producing the hologram.

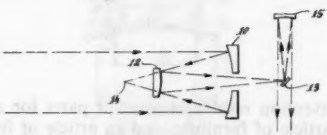


3,674,333
RAINBOW KALEIDOSCOPE
Mark Mandel, 890 West End Ave., New York, N.Y. 10025
Filed Aug. 19, 1970, Ser. No. 65,195
Int. Cl. G02b *27/08*
U.S. Cl. 350—5 **8 Claims**



This novel kaleidoscope consists of an elongated tubular member having an eye piece opening at one end and open at the opposite end, a polarized sheet covering the eye piece opening, three or two elongated mirrors positioned at angles to each other, and a short tubular member rotatably connected to the elongated tubular member. The outer end of the short tubular member is covered by two parallel sheets, the inner sheet being clear and the outer sheet being polarized. A number of mica pieces, or other polarized pieces, are positioned between the parallel sheets.

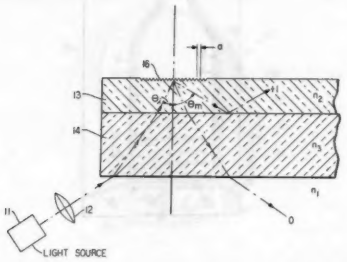
3,674,334
CATOPTRIC ANASTIGMATIC AFOCAL OPTICAL SYSTEM
Abe Offner, Darien, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.
Filed Jan. 4, 1971, Ser. No. 103,495
Int. Cl. G02b *17/06, 23/02*
U.S. Cl. 350—55 **6 Claims**



A catoptric anastigmatic afocal optical system is formed by two concave paraboloidal reflectors of different powers and a convex hyperboloidal reflector each adapted to receive and focus radiant energy. A paraboloidal reflector

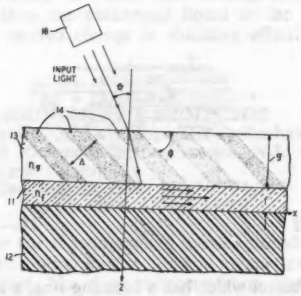
and the hyperboloidal reflector have their axes optically coincident and are positioned with the real focus of this paraboloidal reflector at the virtual focus of the hyperboloidal reflector. The axis of the other paraboloidal reflector is optically coincident with the axis of the hyperboloidal reflector and its real focus is coincident with the real focus of the combination of the first paraboloidal reflector and the hyperboloidal reflector. By having the sum of the powers of all the reflectors equal zero; all third order aberrations except distortion are zero; if the sum is not zero, third order aberrations, other than field curvature and distortion, are zero.

3,674,335
LIGHT WAVE COUPLING INTO THIN FILM LIGHT GUIDES
Arthur Ashkin, Rumson, and Erich Peter Ippen, Middletown, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed May 25, 1970, Ser. No. 40,079
Int. Cl. G02b *5/14, 5/18;* H01p *3/00*
U.S. Cl. 350—96 WG **14 Claims**



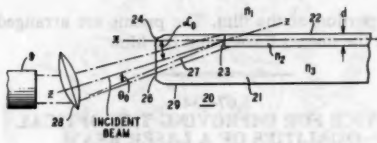
Light waves are coupled into an optical wave guide by means of an optical grating disposed along one surface of the guide. The coupling is varied by varying the angle of incidence of the light to be coupled.

3,674,336
LIGHT WAVE COUPLING INTO THIN FILM LIGHT GUIDES WITH BRAGG TYPE GRATINGS
Herwig Werner Kogelnik, Fair Haven, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Aug. 28, 1970, Ser. No. 67,857
Int. Cl. G02b *5/14, 5/18*
U.S. Cl. 350—96 WG **5 Claims**



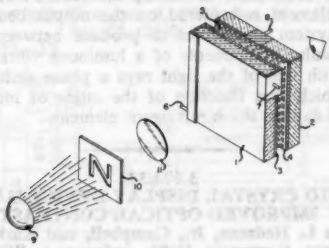
Light coupling into thin optical waveguiding films is achieved by means of a thick Bragg type diffraction grating extending along one surface of the film. When the light is incident at or near the Bragg angle, unwanted diffraction orders are suppressed and efficient coupling is realized.

3,674,337
BEAM COUPLING TO AND FROM THIN FILM WAVEGUIDE
Enrique Alfredo Jose Marcatili, Rumson, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Dec. 7, 1970, Ser. No. 95,690
Int. Cl. G02b *5/14;* H01p *3/00*
U.S. Cl. 350—96 WG **4 Claims**



Harmful effects associated with imperfections at the end of a thin film optical waveguide are avoided in a coupling arrangement in which the dielectric waveguide strip is terminated inside the substrate. The exciting beam is directed towards the end of the guide from within the substrate at a preferred angle of incidence. The optimum beam angle is also specified. Excitation efficiencies of the order of 90–97 percent are predicted.

3,674,338
REAR PROJECTION SCREEN EMPLOYING LIQUID CRYSTALS
James V. Cartmell, Dayton, and Donald Churchill, Kettering, Ohio, assignors to The National Cash Register Company, Dayton, Ohio
Filed Aug. 5, 1970, Ser. No. 61,131
Int. Cl. G03b *21/56*
U.S. Cl. 350—117 **9 Claims**

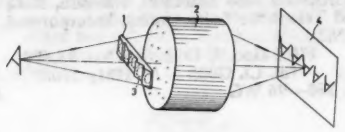


A rear projection screen is disclosed wherein organic nematic mesomorphic compounds, i.e., liquid crystals, are employed. The liquid crystals have a threshold electric field which when exceeded causes the liquid crystals to scatter light. A thin film of the liquid crystal in the light scattering mode can be used for a screen in a rear projection system.

3,674,339
STEREOSCOPIC PHOTOGRAPH SYSTEM USING A STEREOSCOPIC ATTACHMENT TO A CAMERA
Kazuo Sayanagi, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Sept. 16, 1970, Ser. No. 72,640
Int. Cl. G02b *27/22, 5/04;* G03b *35/08*
U.S. Cl. 350—130 **23 Claims**

In the disclosed system for taking stereoscopic photographs, a plurality of prisms are formed from a single

sheet and arranged within the field of a single objective on a camera. Each prism makes a separate image on a



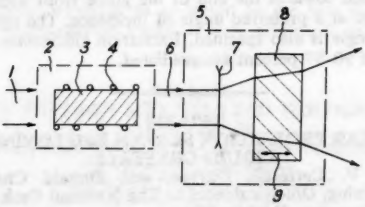
different portion of the film. The prisms are arranged to distribute the images throughout the film.

3,674,340

DEVICE FOR IMPROVING THE OPTICAL QUALITIES OF A LASER BEAM

Louis Jacob, Saint-Germain-les-Arpajon, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Jan. 26, 1971, Ser. No. 109,784
Claims priority, application France, Feb. 10, 1970, 7004668
Int. Cl. C02f 1/24
U.S. Cl. 350—157 4 Claims



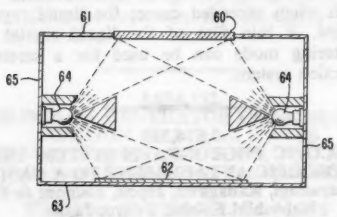
An optical system centered on a substantially parallel light beam produced by a laser is capable of transforming said beam into a beam of light rays having different angles of inclination to the optical axis. A birefringent optical element is centered on the output beam of the optical system and serves to produce between the two perpendicular components of a luminous vibration associated with one of the light rays a phase shift having a value which is a function of the angle of incidence of the light ray on the birefringent element.

3,674,341

LIQUID CRYSTAL DISPLAY DEVICE HAVING IMPROVED OPTICAL CONTRAST

Clarence L. Hedman, Jr., Campbell, and Karl-Dieter S. Myrenne, Sunnyvale, Calif., assignors to SCM Corporation

Filed Dec. 8, 1970, Ser. No. 96,146
Int. Cl. G02f 1/28
U.S. Cl. 350—160 6 Claims



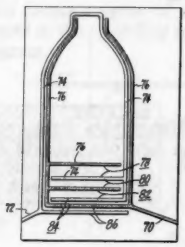
An electro-optical display device is disclosed having a light source and a liquid crystal display panel. The display panel comprises an organic nematic mesomorphic compound confined between two substantially planar parallel surfaces of two juxtaposed transparent plates, and means for establishing electric fields through selected portions of the organic nematic mesomorphic compound. The display device also includes means for directing a beam of light from the light source obliquely onto at least one of the substantially planar parallel surfaces of the transparent plates and onto the organic nematic mesomorphic compound.

3,674,342

LIQUID CRYSTAL DISPLAY DEVICE INCLUDING SIDE-BY-SIDE ELECTRODES ON A COMMON SUBSTRATE

Joseph Anthony Castellano, North Brunswick, and Ronald Norman Friel, Hamilton Square, N.J., assignors to RCA Corporation

Filed Dec. 29, 1970, Ser. No. 102,388
Int. Cl. G02f 1/00; G09f 11/00; G08b 23/00
U.S. Cl. 350—160 R 4 Claims



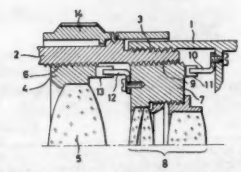
A pair of oppositely disposed substrates sandwich a film of liquid crystal material therebetween. Side by side electrodes, between which a voltage is applied to switch the light transmitting characteristics of the liquid crystal material, are disposed on a single one of the substrates.

3,674,343

LENS BARREL

Goro Hasegawa, Tokyo, and Masaharu Ito, Kawasaki, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 15, 1970, Ser. No. 72,364
Claims priority, application Japan, Sept. 22, 1969, 44/89,353; Feb. 13, 1970, 45/14,047
Int. Cl. G02b 7/02
U.S. Cl. 350—250 3 Claims



A lens barrel which has a focusing ring, a middle cylinder, an outer cylinder fixed to a camera body, a front lens group holder, and a rear lens group holder, wherein the middle cylinder and the outer cylinder are rotatably screwed to each other, the focusing ring is integrally connected to the middle cylinder in a rotatable manner, the middle cylinder has two screwed parts having different leads, and the front lens group holder and the rear lens

group holder are screwed to each of said screwed parts, the front lens group holder being engaged, with key groove, to the rear lens group holder which is engaged, with key groove, to the outer cylinder, thus an aberration is compensated by varying the air spacing between the front lens group and the rear lens group at the time of focusing when the front lens group and the rear lens group make linear movements with different amounts by the rotation of the focusing ring.

3,674,344

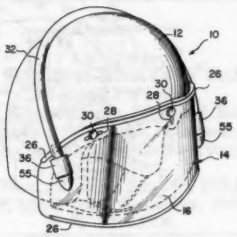
LIGHT ENERGY ABSORBING AND FILTERING DEVICE FOR A MOTORCYCLE HELMET

Mount Lee Lacy, Daytona Beach, Fla., assignor to M. L. Lacy, Ltd., Kansas City, Mo.

Continuation of application Ser. No. 718,182, Apr. 2, 1968, which is a continuation-in-part of application Ser. No. 628,984, Apr. 6, 1967. This application Mar. 30, 1971, Ser. No. 129,612

Int. Cl. G02b *5/24*

U.S. Cl. 350—312 **9 Claims**



A device that adjusts the type and degree of shielding of the eyes from electromagnetic ray energy from the sun by presenting different degrees of screening and filtering of the ray energy, the device having a window-type shield that is formed from spaced layers of transparent material that are edge sealed to provide a thin light transmission cavity therebetween and a connecting storage container with valve means at the connection between the cavity and the container. The device holds two immiscible liquids of substantially equal volume that have different specific gravities so as to maintain separate liquid bodies within the device. By opening the valve means communication is established between the container and the cavity and tilting the device exchanges the liquids by gravity, at which time closing of the valve means maintains the exchanged liquid in the cavity to produce the desired change in shielding effect.

3,674,345

SOUND MOVIE PROJECTOR

Alan Chernotsky, 36 Lakeshore Drive, Rockaway, N.J. 07866, and Richard Satz, Succasunna, N.J.; said Satz assignor to said Chernotsky

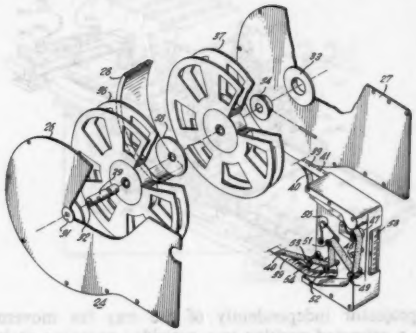
Filed June 30, 1970, Ser. No. 51,217

Int. Cl. G03b *31/04, 23/02*

U.S. Cl. 352—31 **13 Claims**

A projector for showing sound movies stored in a cartridge on silent motion picture film and magnetic recording tape is disclosed. The silent motion picture film and the magnetic recording tape are wound interleaved on a reel. The tape and the film on the reel each follow a path through the cassette in which portions thereof coincide and portions thereof separate to allow for projection of the film and playback or recording on the tape. A guide roller mechanism for the tape is also disclosed which includes a mechanism for maintaining a tension on the tape to take up any slack which develops in the tape and also helps in smoothing out the instantaneous tape velocity as it travels along its path.

A half silvered mirror is mounted in the cassette at an angle with respect to a line normal to the plane in which the film travels along its path.



A circuit is also disclosed for driving a motor in a constant current mode to produce a constant torque on the ends of the film and the tape as a pair of shutter fingers advance the film. In this way, motion is imparted to the ends of the tape thereby moving the tape at the same average velocity as the film. Inertial means are associated with the tape to smooth out the intermittent motion caused by the shutter fingers.

3,674,346

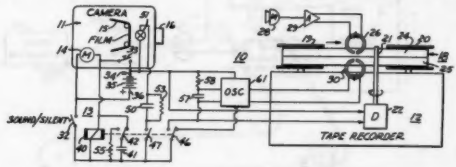
AUDIO-VISUAL RECORDING AND DISPLAY METHODS AND APPARATUS

Joseph H. Lancor, Jr., Arcadia, Calif., assignor to Bell & Howell Company, Chicago, Ill.

Original application Nov. 20, 1967, Ser. No. 684,254, now Patent No. 3,539,248, dated Nov. 10, 1970. Divided and this application Jan. 2, 1970, Ser. No. 5,396

Int. Cl. G03b *31/04*

U.S. Cl. 352—12 **8 Claims**



Audio-visual display methods and apparatus in which sound accompaniments are automatically started in response to indications on the image film, and in which sound sequences are automatically stopped in response to indications on the sound recording medium; and methods and apparatus for providing audio-visual display media in which start indications for sound sequences are provided on image film, while stop indications for sound sequences are provided on the sound recording medium.

3,674,347

FILM CARTRIDGE SUPPORT ASSEMBLY FOR PROJECTORS

Kiyoshi Iha, Elk Grove Village, Ill., assignor to Bell & Howell Company, Chicago, Ill.

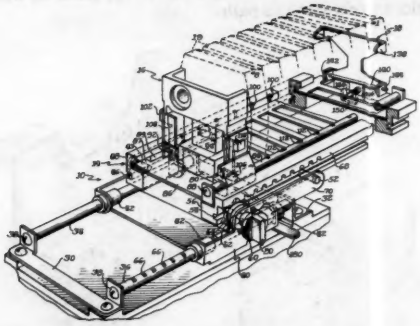
Filed June 25, 1970, Ser. No. 49,799

Int. Cl. G03b *21/04*

U.S. Cl. 352—73 **10 Claims**

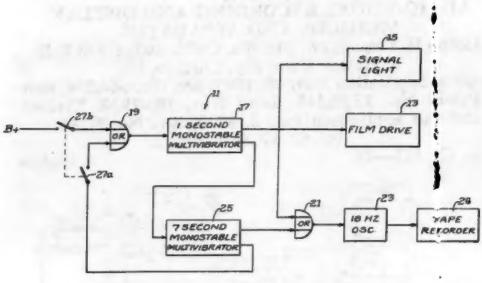
A support assembly operable for supporting any one of a plurality of film supply cartridges at a projection station

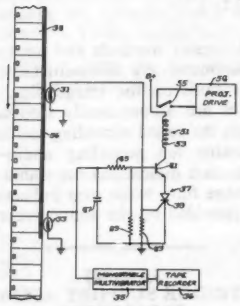
on a motion picture projector. The assembly includes a tray for positioning one of the cartridges at the projection station and includes an aligning member supported on



the projector independently of the tray for movement from a retracted position to a cartridge engaging position for aligning a cartridge at the projection station.

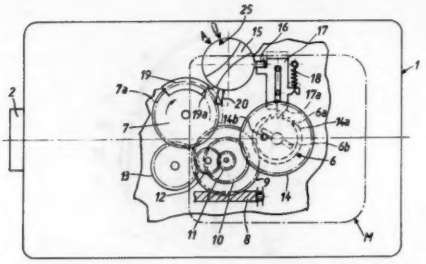
3,674,348
PHOTOGRAPHIC SYSTEM FOR STEP-MOTION PROJECTOR
Erwin E. Figge, Des Plaines, and Edward J. Ho, Chicago, Ill., assignors to Bell & Howell Company, Chicago, Ill.
Filed June 22, 1970, Ser. No. 48,399
Int. Cl. G03b *31/00*
U.S. Cl. 352—84 **9 Claims**





A motion picture recording and projection system adapted for use with audio tape accompaniment including a camera and a projector. The camera, in response to selective actuation, exposes a portion of the film for a predetermined time interval and simultaneously exposes an elongated continuous strip along a margin of the film, corresponding to scenes to be projected at slow speed. The tape recorder runs for a time period which is considerably greater than the operational interval of the camera. During projection, the exposed film margin is detected and utilized to switch the projector drive mechanism from normal to slow speed operation. During slow speed operation the tape accompaniment is driven at its normal play-back and recording speed.

3,674,349
MOTION PICTURE CAMERA WITH AUTOMATICALLY DEACTIVATABLE FADING MEANS
Anton Theer, Munich, Germany, assignor to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany
Filed Apr. 26, 1971, Ser. No. 137,410
Claims priority, application Germany, Apr. 24, 1970, P 20 19 918.2
Int. Cl. G03b *21/36*
U.S. Cl. 352—91 **12 Claims**

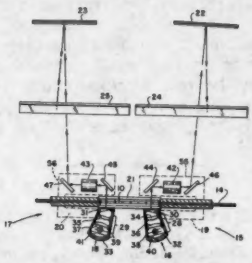


A motion picture camera for use with takeup reels which can be rotated only in a direction to collect the film has a fading mechanism which can temporarily arrest the takeup reel during the making of exposures with fade-out effect so that the length of film which was exposed with such effect is stored in the cassette close to the takeup reel in the form of one or more loose loops. The frame counter is provided or cooperates with a blocking device which deactivates the fading mechanism when the position of the frame counter indicates that the major part of motion picture film is already collected by the takeup reel so that the space around the takeup reel cannot properly store that length of film which is to be exposed with fade-out effect. The blocking device can open a switch in the fading mechanism or can disengage an arresting member of the fading mechanism from the takeup reel so that the latter is free to rotate in a direction to collect the film.

3,674,350
VIEWER
Ulrich Staiger, Stuttgart-Sillenbuch, Germany, assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Apr. 16, 1970, Ser. No. 29,212
Claims priority, application Germany, June 21, 1969, P 19 31 648.4
Int. Cl. G03b *23/08*
U.S. Cl. 353—27 **11 Claims**

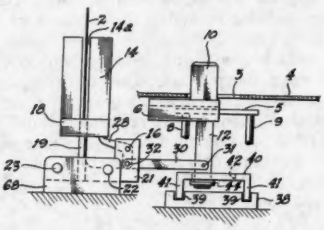
Apparatus is disclosed for simultaneously projecting any two separate images selected from a multiple-image-bearing medium. Two optical projecting devices are provided, each of which includes an illuminating source and an optical deviating element for redirecting light emanating from the illumination source so that it passes through the multiple-image-bearing medium in a direction substantially perpendicular to the surface of the medium. Projection lenses are provided on the opposite side of the

medium from the illuminating sources to form an image of the information contained on the medium. At least one of the projecting devices, including its cooperating lens, is movable and therefore effective to project different



images selected from the multiple-image-bearing medium. In a preferred embodiment, the projected image produced by each optical projecting device can be displayed upon separate display screens.

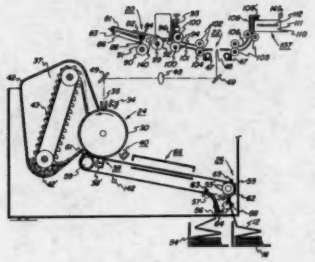
3,674,351
READER FOR INFORMATION CARRIERS IN SHEET FORM
Heinz Streicher, Echterdingen, Siegfried Riek, Esslingen-Weil, and Manfred Leutwein, Rommelshausen, Germany, assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Nov. 12, 1969, Ser. No. 875,815
Claims priority, application Germany, Nov. 26, 1968, P 18 10 959.6
Int. Cl. G03b *23/08*
U.S. Cl. 353—27 **5 Claims**



Apparatus is disclosed for projecting images from information bearing media such as microfiche cards having at least first and second image portions, the projection apparatus including first and second lens or projection assemblies disposed to project images from the first and second image bearing portions. At least one of the first and second lens assemblies being mounted to be movable with respect to the image bearing media to permit the one lens assembly to project the first image and the other lens assembly to project the second image. In a preferred embodiment, the first and second lens assemblies may project the first and second images from the microfiche onto adjacent display screens or surfaces.

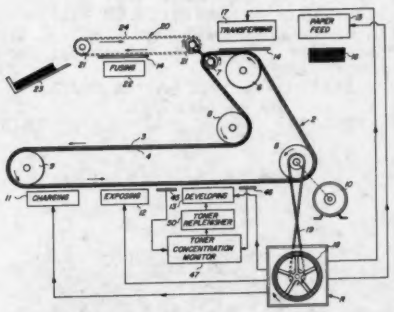
3,674,352
ELECTROSTATIC LABEL PRINTER
Raymond A. Wilmes, Genoa City, Wis., assignor to Xerox Corporation, Stamford, Conn.
Filed June 22, 1970, Ser. No. 49,208
Int. Cl. G03g *15/00, 15/20*
U.S. Cl. 355—3 **4 Claims**

Apparatus for electrostatically printing label information, normally addresses, taken from individual master address cards on a web material for use as an addressing form, the apparatus including a photoconductive member, a scanning station, transport means for feeding the cards forward; means for developing latent images of the card information on the member; a transfer station, means to advance the web material to the transfer station; fixing means to fix the transferred image on the web material;



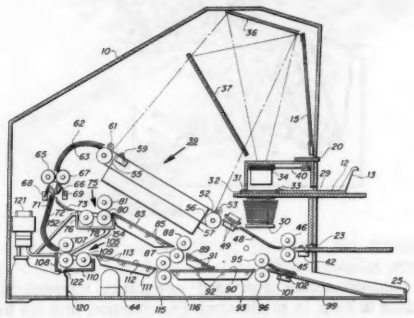
and control means for said apparatus adapted when operated to stop, in predetermined sequence, first the fixing means and then the web material advance means whereby to avoid burning or scorching of the form by the fixing means, the control means being operable in response to interruption in the feed of cards past the scanning station, or interruption in the feeding of said web material, or overfilling of the address card collecting tray.

3,674,353
TONER CONCENTRATION CONTROL APPARATUS
William Trachtenberg, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed July 1, 1971, Ser. No. 158,714
Int. Cl. G03g *15/08*
U.S. Cl. 355—3 **5 Claims**



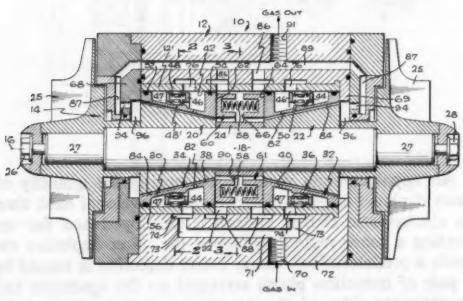
An apparatus and method for sensing the quantity of toner depleted from an electrographic developer each time an electrostatic charge pattern is developed and for activating a toner replenisher when the toner depletion exceeds a predetermined value. Toner depletion is sensed by a pair of induction plates arranged on the upstream and downstream sides of the developing station adjacent the path along which a charge pattern-bearing electrographic recording element travels. The difference in charge induced on such plates by the passage of the undeveloped and developed patterns close by is an accurate measure of the quantity of toner applied to the patterns.

3,674,354
MICROFILM VIEWER-PRINTER
Maurice H. Aratud, Spring Valley, Ronald W. Johnson, Chula Vista, and Prativadi I. Sampath, La Jolla, Calif., assignors to Stromberg Datagraphix, Inc., San Diego, Calif.
Filed July 2, 1970, Ser. No. 51,882
Int. Cl. G03g *15/00, 15/10*
U.S. Cl. 355—5 **5 Claims**



A combined microfilm viewing device and hard-copy printer is disclosed. Hard copies are made on paper from selected microfilm images by an electrostatic process. Two parallel image development devices are provided. Thus, the operator may conveniently select either a negative or a positive paper copy of the microfilm images. Alternatively, the development devices may be arranged to give the operator a choice of two image colors. In a preferred embodiment, a beam-splitter arrangement is provided to simultaneously direct part of the light passing through the microfilm to a viewing screen and part to the electrostatic paper exposure station.

3,674,355
GAS LUBRICATED BEARING
James D. Yearout, Rolling Hills, and Richard E. Tolbert, Torrance, Calif., assignors to Process Services Inc., Gardena, Calif.
Filed May 28, 1970, Ser. No. 41,270
Int. Cl. F16c *17/10*
U.S. Cl. 308—122 **15 Claims**

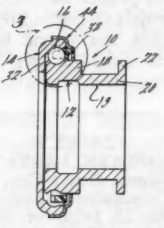


Gas lubricated bearing system comprising a rotating member having a pair of axially disposed journals formed of surfaces of revolution, e.g. conical journals, and a pair of resiliently supported non-rotating bearings formed of surfaces of revolution, e.g. conical surfaces, in juxtaposed position with respect to said journals, forming a gas receiving zone between said journal and bearing surfaces, and a lubricating gas film in said zone, the resilient support for each of the non-rotating bearings including a radial spring support system reacting against a rigid housing, means for hysteresis damping of the bearing system, e.g. elastomeric seal means between the bearings and rigid housing, and an axial spring support system reacting against the pair of non-rotating bearings, and permitting force interaction between the bearings, providing a rapidly responsive highly stable damping system.

3,674,356
CAGE FOR ANGULAR CONTACT BALL BEARING
Edmund A. Zeneski, Bethel, Conn., assignor to The Barden Corporation, Danbury, Conn.
Filed Oct. 30, 1970, Ser. No. 85,457
Int. Cl. F16c *33/66, 33/38*
U.S. Cl. 308—187 **9 Claims**

A cage for the balls of an angular contact ball bearing having the shoulder bounding the raceway of one of its rings at least partially removed in which the cage has a central annular body with ball receiving openings and respective edge flanges extending radially toward said one ring to locations closely adjacent to the cut-away shoulder and adjacent to the remaining shoulder to permit the cage to be controlled by the one ring and to form a lubricant retaining channel into which lubricant can be injected through holes in the flange extending toward the cut-away shoulder.

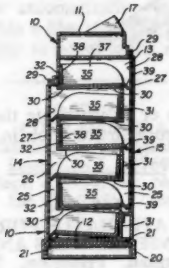
3,674,357
CLUTCH RELEASE BEARING
Eli M. Ladin, Ann Arbor, Harry L. Kegerise, Troy, and John S. Adams, Birmingham, Mich., assignors to Federal-Mogul Corporation, Southfield, Mich.
Filed Mar. 30, 1971, Ser. No. 129,520
Int. Cl. F16c *19/10*
U.S. Cl. 308—233 **6 Claims**



A clutch release bearing assembly comprising a plurality of spherical anti-friction bearing elements adapted

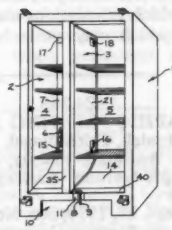
for engagement with semi-spherical raceways in cooperative inner and outer bearing race members, the dimensions of the raceways being of a predetermined relationship with respect to the dimension of the bearing elements.

3,674,358
CABINET FOR STORING MICROSCOPIC SLIDES
Dewey S. C. Sanderson, 4890 Troy St., Denver, Colo. 80239
Filed Sept. 23, 1970, Ser. No. 74,792
Int. Cl. A47f *3/14*; A47b *53/00, 81/00*
U.S. Cl. 312—126 6 Claims



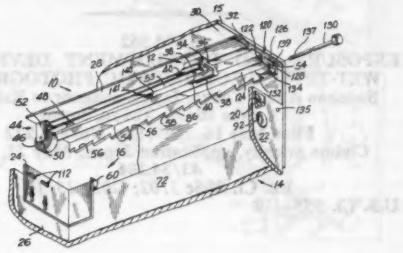
A compact, swivel mounted cabinet for storing microscopic slides, comprising a housing having opposite side walls each provided with drawer-receiving openings arranged in vertical and horizontal rows, said openings leading into recesses, the drawer-receiving openings and recesses of the horizontal rows of one of the side walls being located on different levels than the openings and recesses of the horizontal rows of the opposite side wall; vertical partitions and drawer supporting floors defining each recess. The slide containing drawers comprise bottom, side and inner end walls and have a downwardly inclined tab connected to the forward end of the bottom wall for use in identifying the contents and also for withdrawing the drawer from its recess.

3,674,359
REFRIGERATOR CABINET WITH REMOVABLE PARTITION
William P. Crowe, Louisville, Ky., assignor to General Electric Company
Filed Nov. 17, 1970, Ser. No. 90,349
Int. Cl. A47b *81/00*; F25d *11/00*; B65d *25/18*
U.S. Cl. 312—214 3 Claims



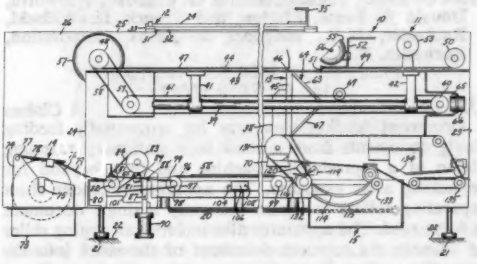
A resin foam insulated refrigerator cabinet comprising a single liner defining a storage space is provided with a vertical partition separating that space into side-by-side storage compartments. The partition is so designed that it can be foamed in place at the same time as the remaining cabinet walls and then easily removed for installation of the refrigeration system.

3,674,360
SECURITY LOCKING DEVICE
George I. Ratner, East Orange, N.J., assignor to Automatic Close & Lock Corporation, East Orange, N.J.
Filed Oct. 29, 1970, Ser. No. 84,986
Int. Cl. E05c *1/02*
U.S. Cl. 312—222 15 Claims



In a receptacle including a security control device for protecting valuables in closure means which is adapted to be moved between open and closed positions with respect to the receptacle, the security control device has a spring biased traveler mounted on a track on the receptacle which traveler pushes the closure means towards its closed position, and locking ratchet and cooperating pawl elements, one of which is mounted on the receptacle and the other of which is secured to the closure means for movement therewith. The ratchet and pawl elements are urged into engagement with each other to hold the closure means against movement to its open position with respect to the receptacle while allowing movement of the closure means towards its closed position when released by the operator.

3,674,361
XEROGRAPHIC COPYING DEVICE
David L. Herman, 63 Catherine Road, Scarsdale, N.Y. 10583
Original application Mar. 20, 1968, Ser. No. 719,291, now Patent No. 3,523,726, dated Aug. 1, 1970. Divided and this application June 24, 1970, Ser. No. 49,236
Int. Cl. G03g *15/00*
U.S. Cl. 355—8 1 Claim



A xerographic type copying device is disclosed which supports planar material to be copied and a carriage slidably disposed beneath the surface of the material to be copied for incrementally exposing portions of the surface

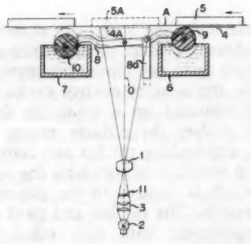
to reflect the same upon a sheet of sensitized material disposed beneath the carriage. Sensitized material is fed from a roll in accordance with preselected increments, the increments being severed when the carriage commences movement in a first direction to expose the increment, and transported to activating device during the period in which the carriage is returning to its initial position. The activating unit includes several chambers formed by septums disposed within a tank containing an activating fluid, and a device is provided for directing successive segments of exposed sensitized material to different chambers whereby several exposed segments or sheets may be simultaneously activated while the device is in operation.

3,674,362

EXPOSURE AND DEVELOPMENT DEVICE FOR WET-TYPE ELECTROSTATIC PHOTOGRAPHY

Sadanao Ando, Tokyo, Japan, assignor to Kabushiki Kaisha Ricoh, Tokyo, Japan

Filed May 16, 1969, Ser. No. 825,222
Claims priority, application Japan, May 21, 1968, 43/34,206
Int. Cl. B05c *1/02*; G03g *13/10*
U.S. Cl. 355—10 **1 Claim**



An exposure and developing device for wet-type electrostatic photography in which prior to exposure a light sensitized sheet is moistened with a pre-moistening liquid or agent. The pre-moistening liquid in tanks disposed on the opposite sides of the exposure device respectively is applied by application rollers to the sensitized sheet being advanced with its light sensitized layer being directed downwardly. By application of the pre-moistening liquid or agent, a soft tone image is obtained, thereby rendering visible the details of the image.

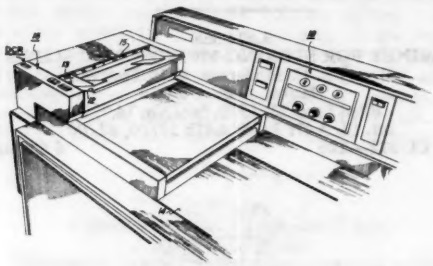
3,674,363

SHEET FEEDING APPARATUS

Ernst O. Baller, Penfield, Melvin G. Crandell, Walworth, Donald L. Pease, Marion, and Francis D. Witinski, Rochester, N.Y., assignors to Xerox Corporation, Rochester, N.Y.

Filed June 10, 1968, Ser. No. 735,677
Int. Cl. G03b *27/62*
U.S. Cl. 355—14 **4 Claims**

Document feeding apparatus for sequentially feeding single documents from a stack to a stationary scanning platen of a reproducing machine and then beyond for restacking after exposure. The apparatus includes sheet separating rollers to insure that only a single document is forwarded. The apparatus also includes an urging roller to advance the topmost document of the stack into the separating rollers. Beyond the separating rolls are a platen transport assembly over the platen and an intermediate transport belt assembly between the separating rollers and the transport belt assembly. Document sensing means are provided to slow down then stop the transport assemblies to position the document in registration on the platen. Control means are also provided to inactivate the feeding apparatus in response to a malfunction in the reproducing machine or to inactivate the reproducing machine in response to a malfunction in the feeding apparatus.

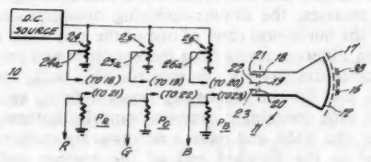


3,674,364

METHOD AND APPARATUS FOR EVALUATING COLOR TRANSPARENCIES AND THE LIKE

Nathaniel I. Korman, Princeton, N.J., assignor to Ventures Research & Development Group, Princeton, N.J.

Filed Mar. 16, 1970, Ser. No. 19,972
Int. Cl. G03b *27/76*
U.S. Cl. 355—38 **10 Claims**



Equipment for evaluating color transparencies utilizing a color kinescope whose intensity and color mix are readily adjustable. The transparency being evaluated is compared against "standard" transparencies, whereby the grid bias voltages of the three-gun kinescope are adjusted to achieve favorable comparison between the transparency being evaluated and the "standard." The values of the three kinescope beam currents necessary to obtain the proper color balance and luminance are employed in mathematical relationships to determine the preparation of color separations (for example) from the transparency being evaluated, which calculations may be performed by computer means, which may either be analog or digital in nature.

3,674,365

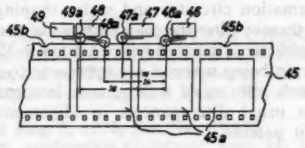
PHOTOGRAPHIC PRINTING APPARATUS

Roland Köhler, Munich, Erich Nagel, Anzing, and Friedrich Hujer and Wolfgang Viehrig, Munich, Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Sept. 28, 1970, Ser. No. 76,069
Claims priority, application Germany, Oct. 22, 1969, P 19 53 015.5
Int. Cl. G03b *27/62*
U.S. Cl. 355—40 **25 Claims**

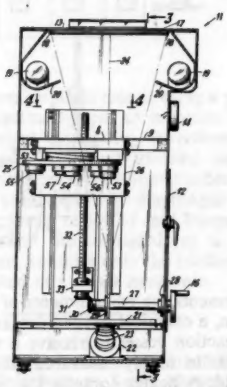
Each film strip has marginal notches that indicate format length of the frames of a film strip. These notches are sensed by feelers that, in one embodiment, actuate

switches that control operation of a motor for positioning the masking elements for printing. In another embodiment, a digital circuit in conjunction with the feelers and



a pulse generator automatically determine the average format length within a film strip and provides a signal for operating the motor to position the masking elements.

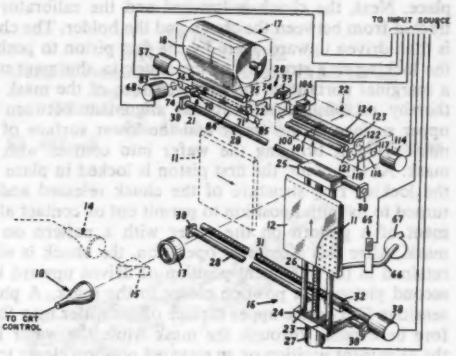
3,674,366
COPY CAMERA
Jack D. Callahan, 524 Ridgeland Terrace, Leonia, N.J. 07605
Filed Sept. 4, 1970, Ser. No. 69,583
Int. Cl. G03b 27/40
U.S. Cl. 355—55 **11 Claims**



A portable copy camera for producing scaled reproductions in any one of a plurality of predetermined proportions. The object to be reproduced and the film are positioned in a fixed constant relationship with respect to each other to define an optical axis. A mechanism is provided for selectively advancing into alignment on the optical axis any one of a plurality of lenses, each lens having a single predetermined location on the axis corresponding to its scale of reproduction. The lenses are designed to provide a uniform effective aperture for constant light transmission when positioned at their respective operative locations.

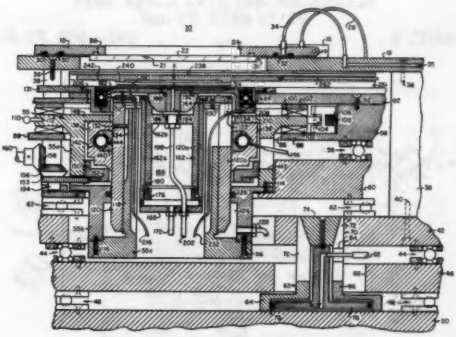
3,674,367
METHOD FOR HANDLING AND POSITIONING FILM
Brian M. Chapman, Trumbull, Conn., assignor to Time Incorporated, New York, N.Y.
Filed June 15, 1970, Ser. No. 46,411
Int. Cl. G03b 27/58; G03c 5/08
U.S. Cl. 355—77 **14 Claims**

A film handling arrangement which repeatedly positions film for selective exposure in a photocomposition process. A film feed uses pulse motor driven pinch rolls to withdraw a precise film length from a supply. A rotary knife crosses and severs the film, applying forces only perpendicular to the film to avoid damaging the film. Movable in mutually perpendicular X and Y directions, a vacuum platen seizes the length of film just before it is severed and, following cutting, precisely positions the film for exposure by a cathode ray tube. For each exposure, the



platen is positioned by mutually perpendicular precision lead screws driven by X and Y positioning pulse motors. When all desired information has been recorded by repeated exposures, the platen moves directly beneath a film export device. A pair of film export pinch rolls closes upon a free film edge and withdraws the film for storage or further processing.

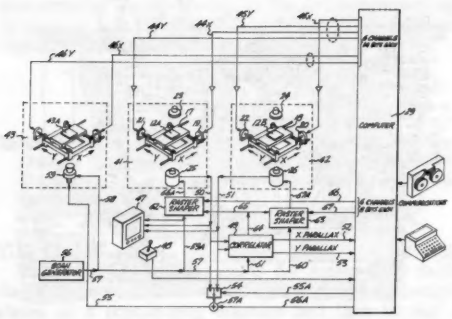
3,674,368
OUT OF CONTACT OPTICAL ALIGNMENT AND EXPOSURE APPARATUS
Karl-Heinz Johannsmeier, 555 W. Middlefield Road, Mountain View, Calif. 94040
Filed May 11, 1970, Ser. No. 36,174
Int. Cl. G03b 27/02
U.S. Cl. 355—78 **35 Claims**



A calibrator is retractably positioned between a mask-bearing holder and a wafer-bearing chuck positioned beneath the holder and provided wtih a peripheral locking ring structure that may be retractably driven upward above the upper surface of the wafer and locked in place. The locking ring structure includes an expandable generally U-shaped locking ring with an inwardly curved bottom wall that is forced outward by an inflatable tube to expand

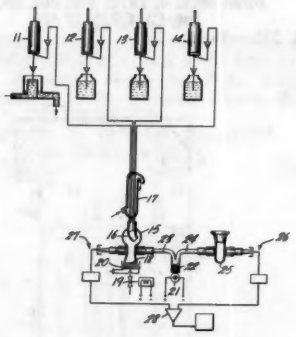
the side walls of the locking ring into locking engagement with a peripheral portion of the chuck. A first piston drives the chuck upward to position a peripheral portion of the upper surface of the wafer in abutment upon a first portion of the calibrator. The locking ring structure of the chuck is driven further upward into abutment upon a second portion of the calibrator, which is inwardly offset from the first portion by a selected distance, and locked in place. Next, the chuck is lowered and the calibrator retracted from between the chuck and the holder. The chuck is then driven upward again by the first piston to position the locking ring structure of the chuck in abutment upon a marginal portion of the lower surface of the mask and thereby establish parallel plane alignment between the upper surface of the wafer and the lower surface of the mask without bringing the wafer into contact with the mask. At this point, the first piston is locked in place and the locking ring structure of the chuck released and returned to its initial position to permit out of contact alignment of a pattern on the wafer with a pattern on the mask. After this alignment operation, the chuck is either retained in the alignment position or driven upward by a second piston to a position closer to the mask. A photosensitive film on the upper surface of the wafer may therefore be exposed through the mask while the wafer is in the alignment position or an elevated position closer to the mask. Following this exposure operation, the first piston is released and the chuck returned to its initial position. These out of contact alignment and exposure operations may also be accomplished without a calibrator or a chuck having a peripheral locking ring structure by employing a chuck having a peripheral spacing ring that may be driven upward a selected distance above the upper surface of a wafer positioned on the chuck.

3,674,369
AUTOMATIC ORTHOPHOTO PRINTER
Gilbert L. Hobrough, Vancouver, British Columbia, Canada, assignor to Hobrough Limited, Vancouver, British Columbia, Canada
Continuation-in-part of applications Ser. No. 760,435, Sept. 18, 1968, Ser. No. 827,428, May 23, 1969, and Ser. No. 67,493, Aug. 27, 1970. This application Oct. 21, 1970, Ser. No. 82,777
Int. Cl. G01c *11/12*
U.S. Cl. 356—2 **18 Claims**



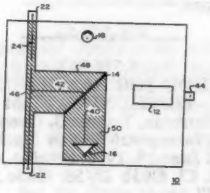
This application discloses an improved system which operates automatically to provide an orthophotograph from one or more pairs of stereo aerial photographs. The system disclosed includes first and second television type photo-scanning devices such as vidicons which are operated in synchronism to provide data signals for each spot of the two photographs making up a stereo pair. Correlation networks operate on the data signals to determine the amount of X and Y parallax. Slope limiting circuits in the X parallax system provide smoothing of the height signal and eliminate discontinuities which may exist in the signals being processed. Image transformation circuitry and raster shaping circuits controlled thereby alter the scan patterns of the two vidicons. The problems associated with changes in the elevation of the terrain being mapped are overcome to an extent such that patch printing of a large area is accomplished without the usual discrepancies in alignment of detail in adjacent patches.

3,674,370
CHEMICAL OXYGEN DEMAND WATER ANALYZER
Per Hjalmar Jonsson, Nynaeshamn, Sweden, assignor to Rederiaktiebolaget Nordstjernan, Nynaeshamn, Sweden
Filed May 11, 1970, Ser. No. 36,316
Claims priority, application Sweden, Jan. 30, 1970, 1,211/70
Int. Cl. G01n *1/00, 21/20, 21/22*
U.S. Cl. 356—36 **7 Claims**



In the representative embodiments of the invention described herein, a chemical oxygen demand water analyzer includes a reaction vessel to receive a water sample and dosage devices to supply measured quantities of dichromate and acid. A heater controls the temperature of the mixture in the vessel and a spectrophotometer determines the concentration of trivalent chromium in the vessel.

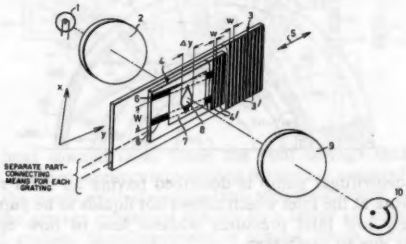
3,674,371
TEMPERATURE COMPENSATION OF A LASER INTERFEROMETER
John N. Dukes, Los Altos Hills, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.
Filed Apr. 13, 1970, Ser. No. 27,954
Int. Cl. G01b *9/02*
U.S. Cl. 356—106 **2 Claims**



A laser interferometer is temperature compensated by selecting the distance between the beam splitter and internal reflector, and the distance between the beam splitter

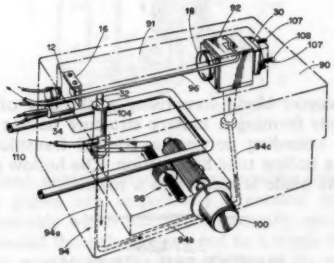
and interferometer clamping plane such that each distance changes by the same amount due to changes in the temperature of the interferometer.

3,674,372
MEANS FOR MEASURING POSITION CHANGES OF TWO RELATIVELY MOVABLE MEMBERS
Adolf Weyrauch, Aalen, Germany, assignor to Carl Zeiss-Stiftung, doing business as Carl Zeiss, Wurttemberg, Germany
Filed Aug. 5, 1970, Ser. No. 61,175
Claims priority, application Germany, Aug. 16, 1969, P 19 41 731.3–52
Int. Cl. G01b *11/04*
U.S. Cl. 356—169 **10 Claims**



The invention contemplates means using a photoelectric scanning-grating optical system to measure relative displacement, as tracked by relative movement of the respective grating members, and utilizing movement of fringe lines as occasioned by grating-member movement. The invention so combines filter diaphragm means with the grating system, in the region of said fringe lines thereof, that the photocell output signal, as a function of grating displacement, contains only the fundamental wave of the distance period or a single harmonic.

3,674,373
DIFFERENTIAL REFRACTOMETER
James L. Waters, Framingham, Louis Abrahams, Worcester, and Burleigh M. Hutchins, Jr., Framingham, Mass., assignors to Waters Associates, Inc., Framingham, Mass.
Filed Feb. 2, 1970, Ser. No. 7,959
Int. Cl. G01r *21/46*
U.S. Cl. 356—130 **17 Claims**

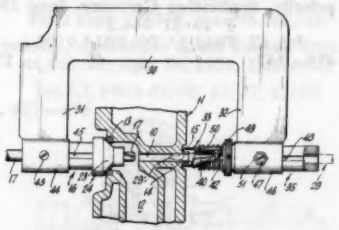


A differential refractometer characterized by the use of a massive metallic optical bench comprising a recessed compartment for holding and thermally shielding the optical components thereof. The optical bench comprises a novel heat exchanger whereby improved peak-resolution and temperature control of sample liquid are attained simultaneously. This improvement is achieved by keeping successive segments of a sample inlet tube buried within the block and thermally insulated one from another. An improved and simplified light source contributes to the low cost and overall thermal stability of the instrument.

3,674,374
BACK SCRUBBER
Doris E. Jennings, 4754 W. Evans Creek Road, Rogue River, Oreg. 97537
Filed Oct. 23, 1970, Ser. No. 83,449
Int. Cl. A47k *7/03*
U.S. Cl. 401—8 **2 Claims**

For use while taking a shower or tub bath and in lieu of a soap-laden wash cloth or sponge, a back soaping and scrubbing appliance comprising a scrubber made of open-meshed tulle-like nylon of a prescribed length and width, and having flexible loop-shaped handles at its respective ends. The median body portion of the scrubber is provided with one or more accessible pockets containing soap. By catching hold of and properly manipulating the handles the scrubber can be swished and swashed back and forth in a manner to effectually wash the upper part of the back and shoulders.

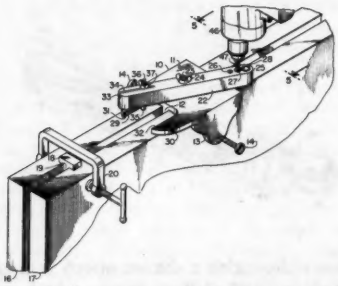
3,674,375
VALVE-GUIDE CORING TOOL
Everett E. Reed, Libby, Mont., and James S. Boynton, Monroe, Conn., assignors to United Tool Processes Corporation, New Canaan, Conn.
Filed Apr. 7, 1971, Ser. No. 132,135
Int. Cl. B25b *47/28*
U.S. Cl. 408—103 **9 Claims**



The invention contemplates a portable jig having means for establishing a reboring, reaming or coring axis for the valve-stem guide bore of a worn valve structure, by prime reliance on separate centering techniques at both the seat and actuating ends of the axis of the valve, to re-establish the axis of the valve through the center of the seat, even though the worn-seat axis at the time may be slightly offset from its original orientation. Once the axis to be cored has been thus established, clamp means of the invention retains the reference and also positions guide

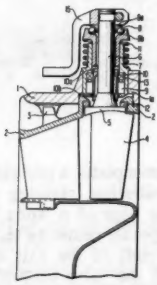
means for the coring tool. After finishing the expanded valve-stem guide bore, based on the new reference axis, a valve-stem guide insert is installed, and the seat is finish-machined in the customary manner, with minimum removal of seat material.

3,674,376
DOWELING JIG
Howard Silken, % Home and Industry Tool Distributors Inc., 2867 Long Beach Road, Oceanside, N.Y. 11572
Filed Feb. 18, 1971, Ser. No. 116,563
Int. Cl. B23b *47/28*
U.S. Cl. 408—115 **9 Claims**



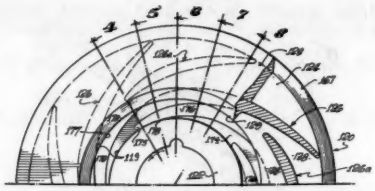
A doweling jig body clamps over the edges of two boards to be doweled together, the doweling jig body having a central positioning member extending downward between the boards and an arm pivotally mounted above it, the arm having at least one drill bushing in its front end and a longitudinally movable stop fixed in its back end, the stop extending downward to engage two inward facing surfaces of the jig body so that the stop allows the arm to pivot the same distance right and left to position at least one drill bushing over each board to drill a dowel receiving hole.

3,674,377
GUIDE BLADING FOR TURBO MACHINES WITH ADJUSTABLE GUIDE VANES
Klaus Trappmann, Karlsfeld, Germany, assignor to Motoren- und Turbinen-Union Muenchen GmbH, Munich, Germany
Filed June 17, 1970, Ser. No. 46,977
Claims priority, application Germany, June 19, 1969, P 19 31 044.2
Int. Cl. F04d *23/00*; F01d *9/00*
U.S. Cl. 415—147 **17 Claims**



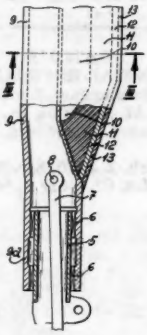
A guide blade assembly in which a guide blade is supported by its blade shaft in the relatively fixed part by means of two bearings, of which the bearing nearer the guide blade is a roller bearing with an inner race in the form of a bush securely mounted over the blade shaft and in contact therewith only by way of two relatively narrow annular surfaces.

3,674,378
CENTRIFUGAL PUMP FOR OPERATING AT LOW SUCTION HEAD
John W. Erickson, 17072 Westport Drive, Huntington Beach, Calif. 92646
Continuation-in-part of application Ser. No. 761,769, Sept. 23, 1968. This application Aug. 13, 1970, Ser. No. 63,549
Int. Cl. F04d *29/18, 13/02, 11/06*
U.S. Cl. 416—177 **6 Claims**



A centrifugal pump is described having an axial ramp structure at the inlet which allows hot liquids to be pumped at very low inlet pressures without loss of flow or capacity due to cavitation.

3,674,379
HELICOPTER ROTOR BLADE
Giancarlo Monti, Varese, Italy, assignor to Siai-Marchetti S.p.A., Varese, Italy
Filed Jan. 26, 1970, Ser. No. 5,886
Claims priority, application Italy, Jan. 30, 1969, 12,171/69
Int. Cl. B64c *27/48*
U.S. Cl. 416—226 **4 Claims**

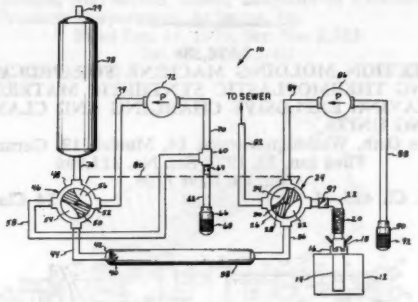


A helicopter blade comprising a plurality of bonded components forming a unitary structure having a longitudinally extending portion, a gradual transitional portion and a hollow tube-like portion. The hollow root portion of the blade is secured to a rotor.

3,674,380
MARINE SEWAGE PUMP
Russell E. Bauer, Warren, Mich., assignor to KDI-Bauer Corporation, Warren, Mich.
Filed May 8, 1970, Ser. No. 35,607
Int. Cl. F04f *11/00*
U.S. Cl. 417—92 **8 Claims**

A marine sewage pump system for emptying a boat sewage tank of human sewage and refilling it with fresh

water. The sewage pump system includes a pump, appropriate piping and a surge tank normally filled with fresh water and arranged for connection between the pump and the boat sewage tank. The pump draws the fresh water from the surge tank, which in turn draws the sewage from



the boat sewage tank. Once the boat sewage tank has been emptied, appropriate valving means are actuated such that the pump refills the surge tank with fresh water, pumping the sewage contained therein to a sewer or other disposal system. Simultaneously, a second pump refills the boat sewage tank with fresh water.

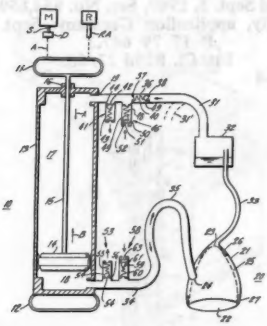
3,674,381

PORTABLE MECHANICAL VENTRICULAR ASSISTANCE DEVICE

Peter Schiff, R.D. 2, Lambertville, N.J. 08530

Filed July 30, 1970, Ser. No. 64,906

Int. Cl. F04b *21/00, 43/00, 45/02, 21/02, 39/10*
U.S. Cl. 417—234 **6 Claims**



Sustained negative pressure and positive and negative pressure pulses are respectively generated by a hand pump assembly which includes a manually operable handle connected through a piston rod to a single reciprocating piston mounted within the cylinder of the pump. The piston effectively divides the cylinder into two chambers, one of which is coupled through a conduit to provide sustained negative pressure. The remaining chamber is coupled through a second conduit to provide for the alternating positive and negative pressure pulses. Suitable adjustable relief valves are provided in each of the conduits to regulate the pressure levels and the positive or negative pressure directed to the cup.

The present invention relates to circulatory sustaining devices, and more particularly to a novel portable mechanical pump device for sustaining both negative and positive and negative pumping actions at separate outlets.

3,674,382

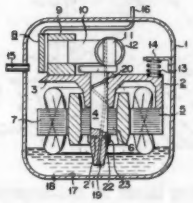
HERMETICALLY SEALED ELECTRIC COMPRESSOR

Tadao Kubota and Keisuke Ida, Fuji-shi, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed Feb. 4, 1971, Ser. No. 112,631

Claims priority, application Japan, June 25, 1970, 45/62,620

Int. Cl. F04b *17/00, 35/00, 39/02;* **F01m** *1/00*
U.S. Cl. 417—372 **4 Claims**



A hermetically sealed electric compressor comprising a longitudinal lubricant passage for conducting a lubricant to the rotating and sliding parts and a revolving shaft provided with a receptacle passage crosswise passing through said lubricant passage and revolving shaft, wherein the revolving shaft is fitted with a ring sleeve and the receptacle is disposed between the sleeve and the opening of the receptacle passage penetrating the outer surface of the shaft thereby to receive solid foreign matter in the receptacle.

3,674,383

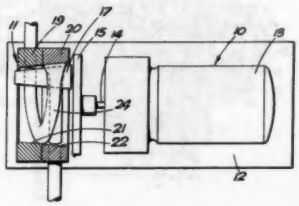
PUMPS

Frank Iles, Loscombe, Four Lanes, Redruth, Cornwall, England

Filed Sept. 1, 1970, Ser. No. 68,749

Claims priority, application Great Britain, Sept. 5, 1969, 44,040/69; Apr. 16, 1970, 18,296/70

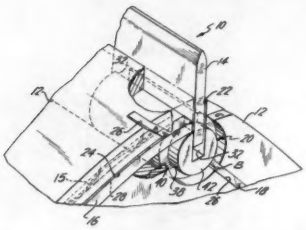
Int. Cl. F04b *43/08, 43/12, 45/06*
U.S. Cl. 417—476 **4 Claims**



A peristaltic pump comprises a flexible tube in the form of a coil having a single complete convolution encircled by

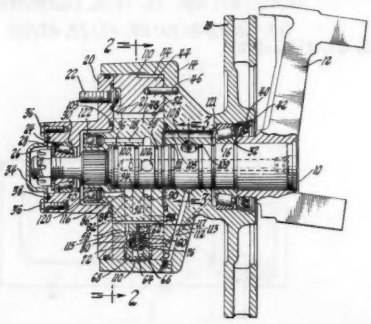
a fixed support, and a member disposed to compress a part of the tube against said support and rotatable about the central axis of the coil. The length of the member in the direction of said axis is such that the member successively compresses all parts of the convolution of the tube during each rotation of the member. The internal surface of the support is conical, and the member is conical or inclined so that the pressure of the member on the tube may be adjusted by axial movement of the member.

3,674,384
FLUID SEAL FOR PISTON OF ROTARY PISTON MECHANISM
John Larrinaga and Charles Jones, Hillsdale, N.J., assignors to Curtis-Wright Corporation
Filed Mar. 30, 1971, Ser. No. 129,327
Int. Cl. F01c *19/00*; F03c *3/00*; F04c *27/00*
U.S. Cl. 418—120 **11 Claims**



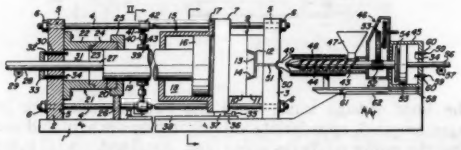
The apex fluid seal assembly for a rotary piston mechanism comprises, in combination with an apex seal blade and at least one side seal strip, an apex seal pin formed to provide a reduced diameter portion dimensioned to intersect the inner surface of the side seal strip groove in the rotary piston in substantially tangential relationship on one side of the apex seal blade so that the side seal strip overlaps the pin and engages the said reduced diameter portion in a sealing line contact and abuts the shoulder formed by the reduced diameter portion.

3,674,385
FLUID VANE MOTOR
Robert P. Rohde, Saginaw, Clarence E. Welsh, Merrill, and Hans Engelhardt, Saginaw, Mich., assignors to General Motors Corporation, Detroit, Mich.
Filed Aug. 28, 1970, Ser. No. 67,752
Int. Cl. F01c *1/00*; F03c *3/00*
U.S. Cl. 418—177 **4 Claims**



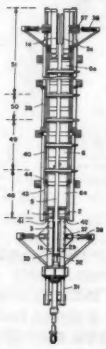
A fluid motor having a rotatable outer ring and a stationary inner cam member. A plurality of vanes are slidably disposed in the ring member and extend inwardly therefrom into fluid chambers formed between the ring and cam. A fluid operated piston with differential areas on the ends is associated with each vane member such that the presence of fluid pressure to drive the motor operates on the piston to move the vanes inwardly to engage the surface of the cam thus forming closed fluid chambers between the ring and the cam.

3,674,386
INJECTION MOLDING MACHINE FOR PROCESSING THERMOPLASTIC SYNTHETIC MATERIAL HAVING EXPLOSIVE CHARGING AND CLAMPING UNITS
Hans Orth, Washingtonstrasse 14, Munich 19, Germany
Filed Jan. 29, 1971, Ser. No. 111,006
Int. Cl. B29f *1/06*
U.S. Cl. 425—1 **14 Claims**



The specification discloses an injection molding machine having an injection unit and a mold closing and clamping unit, each of which has an actuating piston reciprocable in a respective cylinder. The cylinders are arranged for receiving explosive charges which can be ignited or detonated to actuate the mechanism connected thereto. Control of the detonation of the explosive charges is coordinated with the operation of the injection machine.

3,674,387
APPARATUS FOR THE PRODUCTION OF CONTINUOUS LENGTHS OF FOAMED POLYSTYRENE
Eugen Gonon, Schleitheim, Switzerland, assignor to Badische Anilin- and Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany
Filed Sept. 3, 1969, Ser. No. 854,859
Claims priority, application Germany, Sept. 6, 1968, P 17 79 647.3
Int. Cl. B29d *27/00*
U.S. Cl. 425—4 **10 Claims**



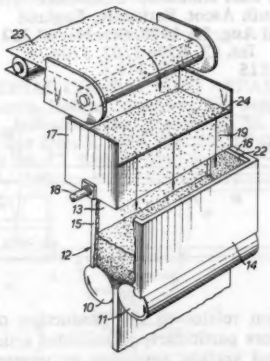
Apparatus for the production of continuous lengths of foamed plastics material, particularly foamed polystyrene, comprising a chamber for the temporary accommodation of the material, which chamber is formed on at least two

opposite sides by panels guided on rails and movable by means of a pushing device in the direction of feed of the material.

3,674,388
MANUFACTURE OF PLASTIC SIDING
Peter F. Heilmayr, Sol B. Kimbrell, and Joseph C. Giuffre, McPherson, Kans., assignors to Certain-Teed Products Corporation, Ardmore, Pa.
Filed Jan. 14, 1970, Ser. No. 2,723
Int. Cl. B29f *3/00*
U.S. Cl. 425—72 **4 Claims**

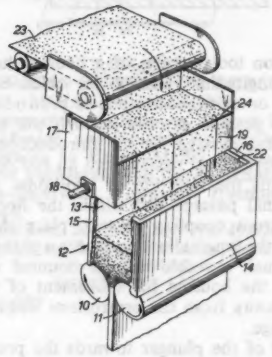
Plasticated polyvinyl resin material is extruded in a shape approximating the cross sectional shape of the siding and equipment is provided for air sizing and air cooling the extruded shape, so as to accurately dimension the siding as it is being hardened.

3,674,389
APPARATUS FOR PRODUCTION OF METAL STRIP FROM METAL POWDER
George McHardy Sturgeon, Sheffield, and George Jackson, Dronfield Woodhouse, near Sheffield, England, assignors to The British Iron and Steel Research Association, London, England
Filed July 27, 1970, Ser. No. 58,586
Claims priority, application Great Britain, Aug. 6, 1969, 39,328/69
Int. Cl. B29d *7/00*; B30b *3/00*
U.S. Cl. 425—79 **8 Claims**



In apparatus for the roll compaction of metal powder to form metal strip including compacting rolls and a hopper for supplying the powder to the roll nip, the distribution of powder along the length of the roll nip is controlled by the provision of a weir forming part of a container situated above the hopper and arranged so that powder flows over the weir directly into the hopper. By shaping the weir edge so that each end of the edge is below the middle portion of the edge, a strip can be produced with improved uniformity of weight per unit area across the strip width.

3,674,390
PRODUCTION OF METAL STRIP FROM METAL POWDER
George McHardy Sturgeon, Sheffield, and George Jackson, Dronfield Woodhouse, near Sheffield, England, assignors to The British Iron and Steel Research Association, London, England
Filed July 27, 1970, Ser. No. 58,587
Claims priority, application Great Britain, Aug. 6, 1969, 39,328/69
Int. Cl. B29d *7/14*
U.S. Cl. 425—79 **4 Claims**

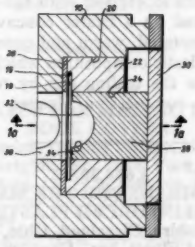


In the roll compaction of metal powder to form metal strip the powder is supplied to the roll nip by means of a hopper. The end walls of the hopper have a central porous area through which gas can be passed. This prevents the powder sticking to the end walls. Thus, powder can be fed uniformly to the roll nip so that strip of constant weight per unit area across its width can be produced.

ERRATUM

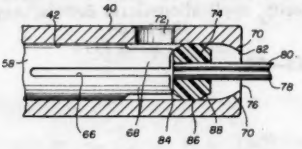
For Class 425—80 see:
Patent No. 3,674,599

3,674,391
APPARATUS FOR PRODUCING AND DECORATING HOLLOW BODIES MADE OF THERMOPLASTIC MATERIAL
Dieter Welle, Esslingen (Neckar), Germany, assignor to Etimex Interplastic G.m.b.H., Rapperswil-Jona, Switzerland
Filed Jan. 13, 1970, Ser. No. 7,301
Int. Cl. B29d *23/03*
U.S. Cl. 425—109 **7 Claims**



Apparatus for producing and decorating hollow bodies in which a tubular blank is expanded in soft condition in a mould, while a punch reciprocable in a mould part cuts a label from a strip and applies it to the hollow body.

3,674,392
EXTRUSION TOOL
Daniel Eppler, Nutley, N.J., assignor to Thomas & Betts Corporation, Elizabeth, N.J.
Filed Oct. 20, 1969, Ser. No. 867,652
Int. Cl. B29f *3/00*
U.S. Cl. 425—109 **11 Claims**



An extrusion tool consists of a housing having therethrough a longitudinal passage in which is placed, at one end, one or more protrusions or protruding surfaces. A transverse passage extends through the housing into the longitudinal passage for the introduction of articles within the longitudinal passage and an end opening and/or slot permits the insertion of additional articles into the longitudinal passage and within the first mentioned article to permit coupling to take place therebetween. Fitted within the longitudinal passage is a plunger activated from a manual, movable handle mounted to both the plunger and the housing for movement of the plunger toward and away from the protrusions within the longitudinal passage.

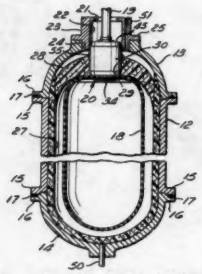
Movement of the plunger towards the protrusions extrudes the first mentioned article about second articles also inserted within the longitudinal passage. Varying extrusion shapes may be accomplished by shaping the cross-section of the longitudinal passage or by the shape and number of the protrusions placed therein.

3,674,393
DEVICE FOR APPLYING LINERS OF THERMOPLASTIC MATERIAL TO CLOSURE CAPS OR THE LIKE
Ettore Busi, 191 Via Selice, Imola, Italy
Filed July 23, 1970, Ser. No. 57,449
Claims priority, application Italy, July 29, 1969, 7,210/69
Int. Cl. B29c *3/00*
U.S. Cl 425—110 **10 Claims**

A device for forming inner coatings of thermoplastic material in sealing caps has a shaft mounted for rotation about a vertical axis, a platform secured to the shaft, bearers for the sealing caps coaxial with the shaft and slidably mounted in the platform, a plate fixed to the shaft above the platform, and compression plungers mounted in the plate in register with the bearers, a sealing cap being placed on a bearer concave side upwards and containing a metered, warm and consequently plastically deformable plastic composition which is formed into an inner coating in the sealing cap by relative displacement between the compression plunger and the sealing cap bearer.

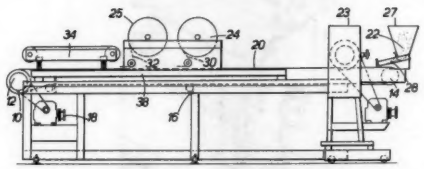
3,674,394
SLIDING CORE MEANS FOR THE MANUFACTURE OF FIBER-REINFORCED PLASTIC TANKS
Arthur J. Wiltshire, Cleveland, Ohio, assignor to Structural Fibers, Inc., Chardon, Ohio
Filed Jan. 18, 1971, Ser. No. 107,075
Int. Cl. B29c *11/00*
U.S. Cl. 425—112 **5 Claims**

Apparatus for forming fiber-reinforced plastic articles by fluid pressure, in which a hollow blank of fibrous matting material is positioned within a mold and an inflatable bag is expanded within the blank to force the blank into firm contact with the inner surface of the mold and to compress the blank against the mold. The blank, while in its compressed state, is injected with a predetermined amount of settable resin and the resin is then cured to provide a hollow, fiber-reinforced plastic article. The apparatus according to this invention includes a core having one end slidably received within an access opening in the mold and the other end of the core carries the fibrous blank. An inflatable bag is positioned within the mold and has an inflating stem which extends through the core so



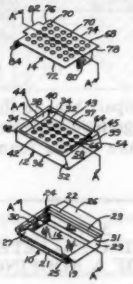
that the fibrous blank is between the bag and the inner mold surface. A sealing ring surrounds the core and positions the blank on the core between the bag and the ring. The core is freely slidable within the access opening, at least for an axial distance which corresponds to the desired compression of the blank so that areas of the blank adjacent the core are firmly compressed against the mold surface by the inflatable bag. As the blank is compressed in this manner, the sealing ring forms a seal between the inner surface of the mold and the access opening to prevent resin from flowing into and fouling the access opening.

3,674,395
MOULDING APPARATUS
Maxwell Alvin Earl Rhiando, "Stonecroft" Friary Road, South Ascot, Berkshire, England
Filed Aug. 12, 1970, Ser. No. 63,222
Int. Cl. B29c *3/02, 3/04*
U.S. Cl. 425—115 **9 Claims**



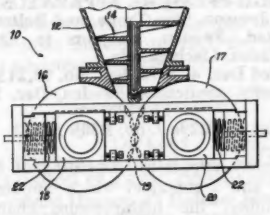
The invention relates to the production of moulded articles and more particularly to moulded articles for use as prefabricated surface coverings or veneers. The invention is concerned with a method of making a moulded article comprising introducing a granular or particulate filler material into a mould, applying a foraminous backing layer to the filler material and applying a settable binding material to the filler material before or after the application of the backing layer so as to coat sufficient of the surface of the granules to effect a bond between the granules and between the granules and the backing layer when the settable binding material is cured and hardens. Apparatus for putting the method into effect is also of interest and various alternative embodiments are disclosed.

3,674,396
BIOLOGICAL SPECIMEN PROCESSING AND EMBEDDING APPARATUS
James Benjamin McCormick, Hinsdale, Ill., assignor to Miles Laboratories, Inc., Elkhart, Ind.
Continuation of application Ser. No. 725,722, May 1, 1968. This application Sept. 21, 1970, Ser. No. 74,159
Int. Cl. B29c *1/00, 1/02, 1/14*
U.S. Cl. 425—117 1 Claim



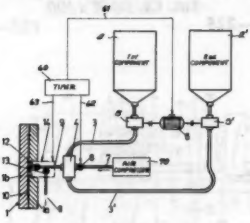
A combination capsule and mold apparatus and treatment of a biological specimen by the use thereof is described wherein a biological specimen can be placed inside a capsule comprising an open-topped box-like open mold having a perforated bottom wall and a removable perforated cover. After the specimen has been processed inside the capsule with desired fluids, the cover is removed from the capsule to form an open mold, the specimen is transferred from the open mold to an open-topped box-like base mold, and the open mold is placed in coupled relation over the base mold. Molten paraffin is then poured through the open mold into the base mold. After the paraffin hardens, the open mold and the rigidly attached paraffin body containing the specimen are separated from the base mold, and the open mold is mounted in the holder of a microtome for subsequent slicing of the paraffin-embedded specimen.

3,674,397
MATERIAL COMPACTING APPARATUS
Leroy S. Harris, Rolling Meadows, Ill., assignor to K-G Industries, Inc., Rosemont, Ill.
Filed Dec. 7, 1970, Ser. No. 95,456
Int. Cl. B29c *3/02, 3/04, 3/06*
U.S. Cl. 425—145 10 Claims



A material compacting apparatus including opposed compacting rolls mounted for lateral displacement to vary the spacing between the rolls depending upon the pressure exerted during compacting. A hopper is positioned above the rolls for holding the material, and a feed screw is located within the hopper for feeding the material to the rolls. Control means are provided for varying the driving action of the feed screw with the variations depending upon any tendency of the pressure applied by the rolls to vary. The feed screw is hydraulically driven and signals are applied to the fluid delivery means for varying the feed screw pressure. Variations in the driving force of the feed screw are designed to offset the forces tending to vary the spacing between the rolls whereby a constant roll spacing, and therefore a product of constant thickness can be achieved.

3,674,398
SCAVENGING SYSTEM FOR INJECTION-MOLDING MACHINE
Siegfried Baumgartner, Sixtnitgern, Hubert Kindler and Rolf Lidl, Munich, and Heinrich Boden, Opladen, Germany, assignors to Krauss-Maffei Aktiengesellschaft, Munich, and Farbenfabriken Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Germany, fractional part interest to each
Filed June 23, 1970, Ser. No. 49,026
Claims priority, application Germany, June 24, 1969, P 19 31 921.2
Int. Cl. B29f *1/00*
U.S. Cl. 425—159 21 Claims

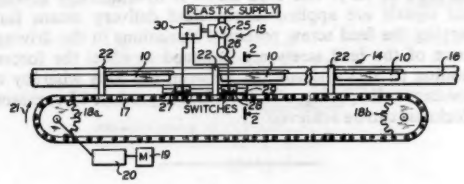


An injection-molding machine for producing articles of foam plastic or the like has a mold cavity provided with an access opening at the end of a supply conduit for the admission of a combination of interacting components from a mixing chamber. A source of compressed air is connected to the mixing chamber via an inlet valve which is opened when the delivery of components to the mixing chamber is stopped; another valve unit at the end of the supply conduit then cuts off the access opening, after a delay sufficient to allow for the discharge of residual material from the mixing chamber into the cavity, and connects that conduit with an exhaust line directing the flow of scavenging air into the atmosphere.

3,674,399
APPARATUS FOR MAKING PLASTIC BOOK COVERS
Mortimer S. Sendor, Queens Village, N.Y., assignor to Bookwrights, Inc., New York, N.Y.
Filed Aug. 13, 1970, Ser. No. 63,395
Int. Cl. B29c *5/00*
U.S. Cl. 425—166 11 Claims

Individually plastic book covers are molded in novel sheet metal molds of simple and inexpensive construction shaped to cast a book cover with stiff front and back panels and with a thin portion for flexibility where the front and back panels have to hinge to open and close the book. The bottoms of the mold cavities may be given

contours for molding decorations and/or legends, as desired, into the outside surfaces of the covers. The molds are shaped to stay in line as successive molds are pushed



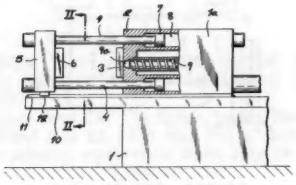
along a guide track by lug on an endless chain, and there are automatic controls for stopping and starting the flow of plastic at a mold filling station.

3,674,400

INJECTION-MOLDING MACHINE WITH OVERHANGING PLATEN SUPPORT

Ernst Sauerbruch, Stein am Rhine, Donat Scherrer, Buch, and Willy Vogt, Zurich, Switzerland, assignors to Fahr Bucher G.m.b.H. Gottmadingen, Gottmadingen, Kreis Konstanz, Germany

Filed Mar. 23, 1970, Ser. No. 21,768
Claims priority, application Germany, Mar. 26, 1969, P 19 15 394.7; June 20, 1969, P 19 31 432.0
Int. Cl. B29f *1/00*
U.S. Cl. 425—225 **8 Claims**



The movable platen of an injection-molding machine, secured to a set of horizontal piston rods, is rested on a track projecting endwise beyond the machine bed, thereby simplifying the collection of molded articles ejected in the open-mold position. The track may be simply cantilevered or braced, preferably adjustably, against the machine frame. To compensate for possible deflection of the cantilevered track under the weight of the platen, its working surface may be slightly inclined so as to rise with increasing distance from the bed; alternatively, an expanding brace may be interposed between the track and the platen to help maintain the latter on a horizontal guide path.

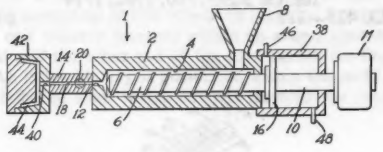
3,674,401

APPARATUS FOR INJECTION MOLDING ARTICLES OF FOAM MATERIAL

Rupert E. Annis, Jr., Salem, and William T. Kyritsis, Beverly Farms, Mass., assignors to USM Corporation, Boston, Mass.

Continuation-in-part of application Ser. No. 644,886, June 9, 1967. This application Dec. 22, 1969, Ser. No. 886,846
Int. Cl. B29f *1/03, 1/08*
U.S. Cl. 425—244 **1 Claim**

Apparatus for molding articles of foamed material comprising a chamber in which a mixture of organic polymeric material and blowing agent is formed at a temperature below the foaming temperature of the blowing agent, mold means having a mold cavity, and means for resisting flow of the mixture from the chamber to



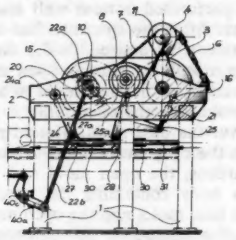
the mold means to impart heat to the mixture. The heat imparted is of a magnitude sufficient to raise the temperature of the mixture to the foaming temperature of the blowing agent.

3,674,402

DEVICE FOR FEEDING PALLETES TO A COMPRESSION STATION OF A ROOFING TILE FORMING MACHINE

Kurt Schade, 31 Visbeker Str., 2878 Wildeshausen, Germany

Filed June 9, 1970, Ser. No. 44,764
Int. Cl. A44b *1/30;* B65g *25/08*
U.S. Cl. 425—306 **5 Claims**



A device for feeding palletes to a compression station of a roofing tile forming machine. Horizontally guided feed fingers, driven by guide arms push forward palletes to a compression station of the machine. Guide arms are driven by connecting rods hinged to two or more crankshafts arranged parallel to one another. The guide arms are also hinged to a fixed point to the feed fingers via transition pieces.

3,674,403

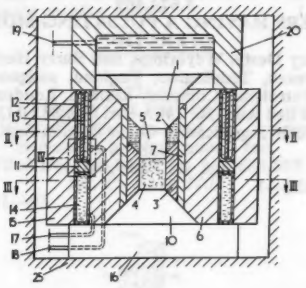
HIGH-PRESSURE APPARATUS

Finn Lennart Jonsson, Sten Trolle, and Baltzar Carl von Platen, Ystad, Sweden, assignors to Etablissement Radiator, Vaduz, Liechtenstein

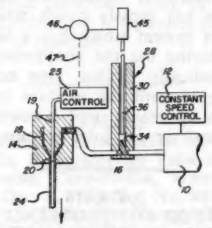
Filed Dec. 4, 1970, Ser. No. 95,213
Claims priority, application Sweden, Dec. 12, 1969, 17,172
Int. Cl. B29c *1/00;* B30b *11/32*
U.S. Cl. 425—330 **5 Claims**

A high-pressure apparatus, consisting of a high-pressure chamber and a container which contains the high-pressure chamber, the high-pressure chamber being bounded by two pressure generating means acting against each other, as well as of a body composed of separate parts and having a substantially convex outside surface, and a central cavity, the said body surrounding the high-pressure chamber, characterised in that the composite body is surrounded by at least two hollow bodies which

are inwardly bounded by a surface that conforms to the outside surface of the composite body, and that the hollow bodies are adapted to be filled with a fluid which can be brought under pressure.



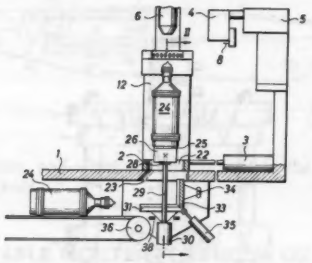
3,674,404
EXTRUDER APPARATUS AND ACCUMULATOR
Norbert W. Burlis and Daniel A. Talonn, University City, Mo., assignors to Sherwood Medical Industries Inc.
Filed Aug. 6, 1970, Ser. No. 61,715
Int. Cl. B29d *23/04*
U.S. Cl. 425—326 **6 Claims**



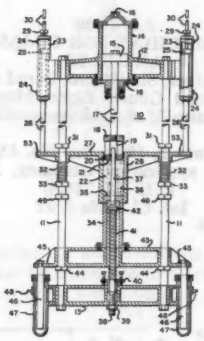
A die and extruder apparatus for producing a wide variety of contoured extrudate such as rod or tubing sections through the provision of a piston and cylinder device interconnected in the molten plastic passage between the extruder and the die with the piston of the piston and cylinder device being driven in a withdrawal stroke to reduce the flow of extrudate from the extrusion die in a programmed manner and being driven in an inject stroke to increase the flow of extrudate through the extrusion die in a programmed manner, to vary the contour of the extrudate at predetermined intervals.

3,674,405
APPARATUS FOR PRODUCING, FILLING AND CLOSING PLASTIC CONTAINERS
Gerhard Hansen, 47 Hofener Strasse, D7013 Oeffingen, Germany
Filed May 7, 1970, Ser. No. 35,439
Claims priority, application Germany, May 7, 1969, P 19 23 236.1
Int. Cl. B29d *23/03*; B29f *1/14*
U.S. Cl. 425—308 **4 Claims**

Apparatus for producing, filling and closing plastic containers in which the container is molded between two lower mold halves and two upper mold halves arranged above the lower mold halves so that the upper mold halves will mold the head of the container.



3,674,406
SOLID PRESS MOLDING APPARATUS
Benjamin Lassman, Pittsburgh, Pa., assignor to Benjamin Lassman & Son, Inc.
Filed Apr. 27, 1970, Ser. No. 31,971
Int. Cl. B28b *3/10*
U.S. Cl. 425—353 **1 Claim**

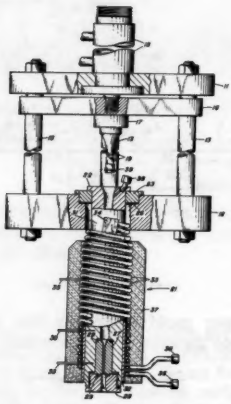


An improved means for obtaining a uniform densification of compressible particulate material wherein a free-floating tapered mold box and forming head are after application of an initial compression removed as a compressive force in order to release internal pressure of the initially formed article. A second force is applied to said article to obtain final form.

3,674,407
EXTRUSION PRESS AND BARREL
Herbert M. Neuhaus, China Lake, Calif., assignor to the United States of America as represented by the Secretary of the Navy
Filed Nov. 16, 1970, Ser. No. 89,739
Int. Cl. B29f *3/00*
U.S. Cl. 425—378 **6 Claims**

A press and interchangeable barrel for extruding explosive and plastic materials in continuous strands of

predetermined cross-section. The barrel, which contains the raw material to be worked upon, is held at a uniform temperature by a coil. A counter flow of heating or cooling fluid is provided in the coil by wrapping it



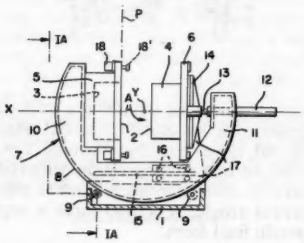
around the barrel such that it turns back upon itself. This provision of counter flow, in the coil, permits precise temperature to be held. The mass of the barrel wall also aids in maintaining a uniform barrel temperature.

3,674,408

MOLDING MACHINE FOR FOAM-PLASTIC ARTICLES

Siegfried Baumgärtner, Sixtnitgern, Bernd Fries, Volkach, and Rolf Lidl and Günter Zippe, Munich, Germany, assignors to Krauss-Maffei Aktiengesellschaft, Munich, Germany

Filed June 5, 1970, Ser. No. 43,801
Claims priority, application Germany, June 6, 1969, P 19 28 780.0
Int. Cl. B29s 3/02
U.S. Cl. 425—406 **10 Claims**



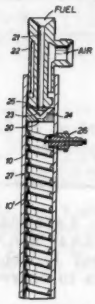
The halves of a split mold to be filled with foamable polymeric material are supported on a frame carrying a hydraulic or pneumatic jack for opening and closing the mold, the frame being swingable through at least 90° about an axis transverse to the direction of mold movement to allow for a positioning of portions of the parting line of the mold halves at different levels facilitating the escape of gases trapped in pockets of the mold cavity or cavities. For the same purpose, the mold halves are also adjustably positioned on the frame in a manner enabling their rotation—continuous or in steps—through a similar angle about an axis extending in the direction of mold movement.

3,674,409

BURNERS HAVING A PULSATING MODE OF OPERATION

Denis Henry Desty, Weybridge, and Barry Herbert Francis Whyman, Teddington, England, assignors to The British Petroleum Company Limited, London, England

Filed Aug. 26, 1969, Ser. No. 853,043
Claims priority, application Great Britain, Sept. 16, 1968, 43,938/68
Int. Cl. F23c 3/02
U.S. Cl. 431—1 **3 Claims**



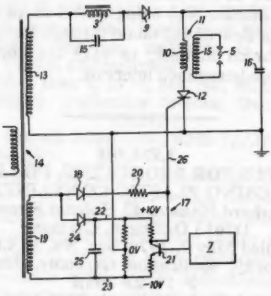
A burner having a pulsating mode of combustion and which can be used to carry out free radical reactions comprises (a) a combustion chamber (preferably cylindrical with an actual length of at least ten times the average diameter) which has grossly rough walls, and (b) an oxygen/fuel inlet system which has a low resistance to gaseous flow. During use the continuously flowing fuel mixture is periodically ignited. One combustion wave travels downstream until the mixture is exhausted and the other travels up-stream until it reaches the point at which the fuel and oxygen inlet systems separate.

3,674,410

APPARATUS FOR CONTROLLING THE OPERATION OF FUEL BURNERS

Kenneth R. Wade, Burscough, near Ormskirk, England, assignor to United Gas Industries Limited, London, England

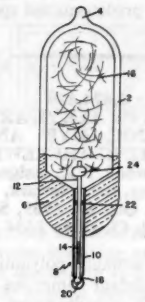
Filed July 21, 1970, Ser. No. 56,917
Claims priority, application Great Britain, Aug. 28, 1969, 42,830/69
Int. Cl. F23n 5/00
U.S. Cl. 431—74 **5 Claims**



The invention provides a burner control apparatus in which operation of a valve supplying a main fuel burner,

and operation of a spark ignition circuit for the burner or a pilot burner, adjacent to the main burner, are both controlled by a single gate-controlled switching device, preferably a thyristor, under control of a flame detector device arranged to detect the presence of a flame at the respective main or pilot burner.

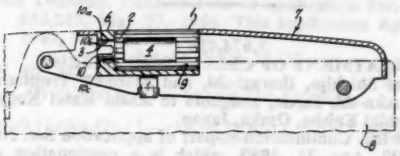
3,674,411
PHOTOFLASH LAMP
John W. Shaffer, Williamsport, Pa., assignor to Sylvania Electric Products Inc.
Filed Dec. 29, 1969, Ser. No. 888,599
Int. Cl. F21k *5/02*
U.S. Cl. 431—93 **9 Claims**



A percussive-type photoflash lamp in which the powdered metallic combustible component of the filminating material thereof is titanium.

3,674,412
ATTACHMENT FOR STORING FLINTS
Pierre Troisoeufs, Bellegarde-sur-Valserine, France, assignor to Ronson Corporation, Woodbridge, N.J.
Filed Dec. 3, 1969, Ser. No. 881,813
Claims priority, appplication France, July 22, 1969, 6924874
Int. Cl. F23q *2/38*
U.S. Cl. 431—124 **3 Claims**

The present invention relates to a cigarette lighter with a new type of attachment for storing and dispensing spare



lighter flints, and which can be located in the fingerpiece of the lighter.

3,674,413
PORTABLE LIGHTER FOR FIRING OIL FIELD HEATERS AND EMULSION TREATERS
G. Frank Fraser, Bentley, Alberta, Canada, assignor to Chevron Research Company, San Francisco, Calif.
Filed Dec. 17, 1970, Ser. No. 99,028
Int. Cl. F23d *13/04*
U.S. Cl. 431—344 **1 Claim**

A portable lighter for use in lighting field heaters and including a burner tip connected to a portable fuel source by means of a telescopic fuel conduit.

CHEMICAL

3,674,414
DYEING HUMAN HAIR AND COMPOSITION FOR INCLUDING AN OXIDATION DYE AND COUPLER THEREOF
Gregoire Kalopissis and Jean Gascon, Paris, Jacqueline Gallien, La Garenne Colombe, Andree Bugaut, Boulogne-sur-Seine, and Hubert Gaston-Breton, Paris, France, assignors to L'Oreal, Paris, France
No Drawing. Filed Dec. 12, 1968, Ser. No. 783,414
Claims priority, application Luxembourg, Dec. 15, 1967, 55,116/67; Aug. 23, 1968, 56,759/68
Int. Cl. D06p *1/32*
U.S. Cl. 8—11 **4 Claims**

A group of coupling agents, of which the following are representative: 3-dimethylamino-phenylurea, 3-dimethylamino-phenylthiourea, (3-hydroxy-6-methoxy) - phenylurea, (3-hydroxy - 6 - methoxy)-phenylthiourea, (2,4-dimethyl - 3 - hydroxy) - phenylurea, (2,4-dimethyl-3-hydroxy)-phenylthiourea, and (4 - methyl - 3 - hydroxy)-phenylthiourea. The invention also includes these couplers in association with oxidation dyes, and a method of dyeing hair using said compositions.

3,674,415
PROCESS OF TREATING LEATHER WITH ALKOXYLATED MANNICH COMPOSITIONS, AND OPTIONALLY TANNING AGENTS, AND PRODUCTS THEREOF
Lucien Sellet, W. Saddle River Road, Saddle River, N.J. 07458
No Drawing. Original application Aug. 22, 1966, Ser. No. 573,789. Divided and this application Jan. 29, 1969, Ser. No. 807,158
Int. Cl. C14c *9/04, 3/18, 3/28*
U.S. Cl. 8—94.21 **6 Claims**

Leather treating agents which are (a) reaction products of hydroxyl containing nitrogen compounds and isocyanate terminated urethane prepolymers or (b) reaction products of hydroxyl containing nitrogen compounds and

isocyanate terminated urethane prepolymers further reacted with acids or quaternizing reagents to produce an acid addition salt or a quaternary ammonium salt.

3,674,416
TREATMENT OF CELLULOSIC FABRICS
Yoshihisa Shichijo, Ibaragi-shi, and Mamoru Tsujihara, Toyonaka-shi, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan
No Drawing. Continuation-in-part of application Ser. No. 818,199, Apr. 21, 1969, which is a continuation of application Ser. No. 405,230, Oct. 24, 1964. This application Jan. 9, 1970, Ser. No. 1,880
Claims priority, application Japan, Oct. 21, 1963, 38/55,846; Dec. 18, 1963, 38/67,868; Dec. 20, 1963, 38/68,332
Int. Cl. D06m *13/40, 15/54*
U.S. Cl. 8—116.3 **8 Claims**

Cellulosic fabrics are provided with crease resistance and high wash and wear ratings by padding the fabric in a solution containing 5–15 wt. percent of a cellulose reactant type cross-linking agent and 5–20 wt. percent of NH_4Cl or NH_4NO_3 and curing the padded fabric at 110°–140° C. for 1–8 minutes.

3,674,417
PROCESS OF ANNEALING RESIN MODIFIED TEXTILE FABRICS
Wolfgang Karl Ferdinand Otto, Spartanburg, S.C., assignor to Deering Milliken Research Corporation, Spartanburg, S.C.
No Drawing. Filed Apr. 25, 1968, Ser. No. 724,223
Int. Cl. D06m *15/58, 15/72*
U.S. Cl. 8—115.5 **12 Claims**

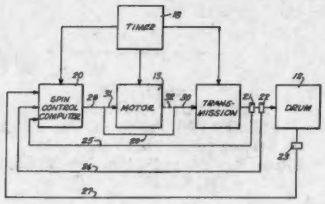
The flat dry properties of textile fabrics containing synthetic fibers are improved by maintaining the fabric in a smooth state at a temperature of at least about 80° C. for a period of at least about 1 hour. The process also is suitable for treating fabrics which have been subjected to a textile resin treatment.

3,674,418
TEXTILE SPRAY COMPOSITION
Richard J. Lyons, Taylors, and Jan Dabrowski, North Augusta, S.C., assignors to United Merchants and Manufacturers, Inc., New York, N.Y.
No Drawing. Filed June 30, 1969, Ser. No. 837,945
Int. Cl. D06m *15/56, 15/58*
U.S. Cl. 8—116.3 **15 Claims**

A storage stable, sprayable, flash-curing, durable press aqueous composition comprising (A) an aminoplast; and (B) a catalyst system comprising (1) (a) magnesium fluoborate; (b) paratoluene sulfonic acid; or (c) sulfamic acid, (2) a salt of a metal of Group II of the Periodic Table, (e.g. $MgCl_2 \cdot 6H_2O$; $ZnCl_2 \cdot 6H_2O$) and (3) a hydroxy carboxylic acid, e.g. tartaric acid). In use the composition is sprayed on a fabric or garment to be treated and the fabric or garment thereafter air dried and creased and cured by household ironing.

3,674,419
SPIN CONTROL FOR A WASHER-DRYER
Oscar A. W. Tichy, St. Joseph, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.
Filed Nov. 25, 1970, Ser. No. 92,716
Int. Cl. D06f *33/02, 37/36*
U.S. Cl. 8—158 **13 Claims**

An automatic combination washer-dryer includes a spin control computer which is responsive to simple digital input signals indicative of drum speed and drum unbalance to effect repeated retumbling operation for laundry



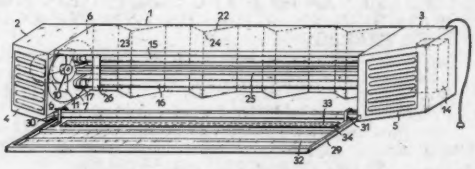
redistribution in response to a predetermined drum unbalance at speeds below a predetermined speed.

3,674,420
CYCLOALKANONE OR ALKYL ARYL KETONE ASSISTING CATIONIC DYE AND AROMATIC POLYAMIDE DYEING THEREWITH
Ira Sapers, Maplewood, N.J., assignor to Arkansas Company, Inc., Newark, N.J.
No Drawing. Filed Oct. 22, 1969, Ser. No. 868,566
Int. Cl. D06p *5/04*
U.S. Cl. 8—173 **5 Claims**

A dye assistant for aromatic polyamide fibrous material is shown. The dye assistant comprises either a cyclic aliphatic ketone such as cyclohexanone or an aryl ketone such as acetophenone.

A method of dyeing such aromatic polyamide material which includes the dye assistant set forth hereinabove is also shown. The method includes the steps of immersing the fiber in a dye bath including water, a surfactant, and the dye assistant of this invention and thence pressurizing the bath and raising the temperature thereof until the dyeing is completed.

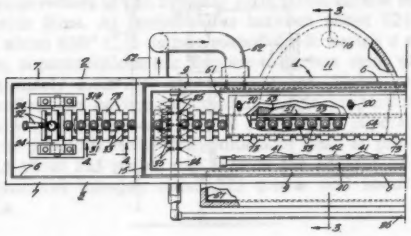
3,674,421
APPARATUS FOR PURIFYING AND STERILIZING PREMISES
Jean A. Decupper, Neuilly, France, assignor to Detec S.A., Geneva, Switzerland
Filed Dec. 19, 1969, Ser. No. 886,514
Claims priority, application France, Dec. 31, 1968, 182,587
Int. Cl. A61l *9/00*
U.S. Cl. 21—74 R **3 Claims**



Apparatus which can be used alternatively to purify or to both purify and sterilize premises such as an operating theatre. A casing in which forced circulation of the atmosphere of the premises can be produced by a fan contains a hot-cathode ultra-violet ray tube and a cold-cathode ultra-violet ray tube. When the premises are to be purified, only the hot cathode tube is operated but

when the premises are to be sterilized also both the hot-cathode tube and the cold cathode tube are operated. Means such as dihedral reflector are provided to delay the passage of the atmosphere over the tubes. A reflector to provide direct irradiation when desired is incorporated in a door of the casing.

3,674,422
MICROWAVE TREATING APPARATUS
Oscar S. Gray, Fort Lauderdale, Fla., assignor to Gray Industries, Inc., Fort Lauderdale, Fla.
Filed May 12, 1970, Ser. No. 36,591
Int. Cl. A61l *3/00*; H05b *9/06*; A23c *3/06*
U.S. Cl. 21—102 R 28 Claims



Apparatus for treating continuously-moving supported articles with microwaves involving an elongated chamber or tunnel having an opening in at least one end thereof adapted to permit the passage therethrough of said moving articles and their supports and means adjacent said opening for providing a mass of droplets of lossy liquid, like water, effective to permit the passage therethrough of said moving articles and their supports while essentially preventing the passage therethrough of microwaves from inside said chamber. Means for supporting and moving the articles through the chamber comprising individual turntables in series in the direction of travel of an endless conveyor system with means for individually rotating each turntable for a predetermined distance are also provided.

3,674,423
CATALYST FOR NITROGEN OXIDE REDUCTION
Richard L. Klimisch, Mount Clemens, Mich., assignor to General Motors Corporation, Detroit, Mich.
No Drawing. Filed Feb. 9, 1970, Ser. No. 9,979
Int. Cl. B01d *53/34*
U.S. Cl. 23—2 E 3 Claims

A catalyst for reducing nitrogen oxides in an automobile exhaust gas stream comprising activated alumina pellets containing up to about 10 mole percent zinc oxide.

3,674,424
PROCESS FOR PURIFYING MOLYBDENITE CONCENTRATES
Robert W. Stanley, Pierrefonds, Quebec, Horace L. Ames, Port Credit, Ontario, and Peter H. Jennings, Pointe Claire, Quebec, Canada, assignors to Brenda Mines, Ltd., Peachland, British Columbia, Canada
No Drawing. Filed Oct. 3, 1969, Ser. No. 863,699
Claims priority, application Canada, May 13, 1969, 51,345
Int. Cl. C22b *59/00*
U.S. Cl. 23—15 W 9 Claims

Impurities are removed from molybdenite concentrates by leaching the concentrates at a temperature of at least 70° C. with an aqueous solution containing at least one alkali metal or alkaline earth metal chloride and at least one oxidising chloride selected from cupric and ferric chlorides.

3,674,425
PROCESS FOR PREPARING A SYNTHETIC CRYSTALLINE ZEOLITE
Harry Edwin Robson, Baton Rouge, La., assignor to Esso Research and Engineering Company
No Drawing. Continuation of application Ser. No. 553,287, May 27, 1966. This application Apr. 2, 1969, Ser. No. 812,929
Int. Cl. C01b *33/28*
U.S. Cl. 23—113 3 Claims

A crystalline zeolite having the formula

$$1.0\pm0.1[x\mathrm{Na_2O}:(1-x)\mathrm{Rb_2O}]:\mathrm{Al_2O_3}:6.5\pm1.0\mathrm{SiO_2}:y\mathrm{H_2O}$$

wherein x has a value of about 0.25 to 0.75 and y has a value of from 0 to about 10, and an X-ray diffraction pattern similar to that of the mineral erionite, is prepared by digesting a reaction mixture containing SiO_2, Al_2O_3, Na_2O, Rb_2O, and H_2O from suitable source materials in specified proportions at a temperature of from about 80° C. to about 150° C. The zeolite product is useful as a selective adsorbent, for example, in the separation of n-hexane or n-octane from their isomers.

3,674,426
PROCESS FOR PRODUCING CRYSTALLINE ZEOLITE A
Tadao Ueda, Kenji Sato, and Yasusi Nakamura, Tokyo, Japan, assignors to Asahidenka Kogyo Kabushiki Kaisha, Tokyo, Japan
No Drawing. Original application Sept. 25, 1967, Ser. No. 670,429, now Patent No. 3,535,075. Divided and this application June 8, 1970, Ser. No. 56,998
Claims priority, application Japan, Sept. 28, 1966, 41/63,892 Sept. 29, 1966, 41/64,255; Dec. 14, 1966, 41/81,553
Int. Cl. C01b *33/28*
U.S. Cl. 23—113 7 Claims

A process for preparing sodium zeolite A which comprises preparing an aqueous sodium-alumino-silicate reactant mixture consisting essentially of (1) oxides of silicon, aluminum and sodium and (2) water, in the proportion, expressed in terms of oxide mol ratios, falling within the following ranges:

	Range 1	Range 2	Range 3	Range 4
Na_2O/SiO_2	0.4–0.7	0.4–0.7	0.7–1	1–4
SiO_2/Al_2O_3	1–2	1–2.5	1–2.5	1–2.5
H_2O/Na_2O	40–100	120–300	220–300	210–300

wherein the major source of silica in the reactant mixture is Allophane, maintaining the reactant mixture at a temperature within the range of 40° C. to 180° C. for a sufficient period to crystallize sodium zeolite A, and separating the crystals from the mother liquor.

A process for preparing sodium zeolite A which comprises preparing an aqueous sodium-alumino-silicate reactant mixture consisting essentially of (1) oxides of silicon, aluminum and sodium and (2) water, in the proportion, expressed in terms of oxide mol ratios, falling within the following ranges:

	Range 1	Range 2	Range 3
Na_2O/SiO_2	0.4–0.7	0.7–1	1–4
SiO_2/Al_2O_3	1–2.5	1–2.5	1–2.5
H_2O/Na_2O	120–300	220–300	210–300

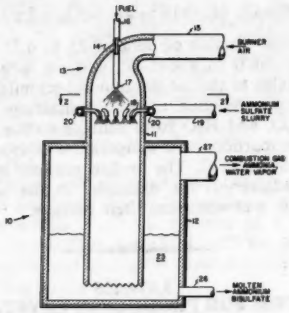
wherein the major source of silica in the reactant mixture is soluble sodium silicate, maintaining the reactant mixture at a temperature within the range of 40° C. to 180° C. for a sufficient period to crystallize sodium zeolite A, and separating the crystals from the mother liquor.

3,674,427

PROCESS FOR DECOMPOSING AMMONIUM SULFATE INTO AMMONIUM BISULFATE AND AMMONIA

Albert B. Welty, Jr., Westfield, N.J., assignor to Esso Research and Engineering Company

Filed Jan. 30, 1970, Ser. No. 7,108
Int. Cl. C01c *1/24, 1/02, 1/12*
U.S. Cl. 23—119 6 Claims



Ammonium bisulfate and ammonia are produced by thermal decomposition of ammonium sulfate. An aqueous slurry of ammonium sulfate is introduced into a flowing stream of hot combustion gases in a decomposition zone. The water is evaporated and the ammonium sulfate is decomposed into gaseous ammonia and molten ammonium bisulfate, which is in the form of droplets suspended in the gas stream. The ammonium bisulfate is separated from the gas stream, and a gas mixture comprising ammonia and hot combustion gases is withdrawn from the decomposition zone.

3,674,428

MERCURY REMOVAL

Warren E. Dean and Charles M. Dorsett, New Martinsville, W. Va., assignors to PPG Industries, Inc., Pittsburgh, Pa.

No Drawing. Filed Dec. 22, 1970, Ser. No. 100,833
Int. Cl. C01g *1/12, 13/00*
U.S. Cl. 23—134 7 Claims

A process for removing mercury from an alkaline solution having a pH of at least 7 is provided comprising intermixing with said solution a sulfur compound in an amount sufficient to provide sulfide ion in an amount greater than the stoichiometric equivalent of mercury, oxidizing the soluble mercury polysulfide and recovering the insoluble mercury sulfide.

3,674,429

ADSORPTION PROCESS FOR WATER AND NITROGEN OXIDES

John Joseph Collins, Katonah, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Filed Jan. 6, 1971, Ser. No. 104,262
Int. Cl. C01b *21/70;* B01d *53/16*
U.S. Cl. 23—159 3 Claims

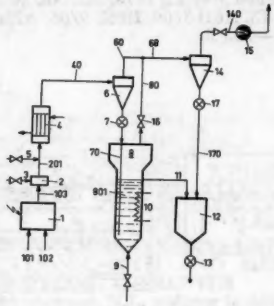
In the process wherein nitrogen oxides are recovered from stack gas streams containing water vapor by selective adsorption using a dual bed of silica gel and molecular sieves, the formation of corrosive aqueous nitric acid in the adsorbent bed during regeneration thereof is prevented by the use of a heat sink interposed between the silica gel and the molecular sieve. The heat sink serves to prevent premature desorption of water from the silica gel bed and the contact of liquid water with desorbed NO_2.

3,674,430

PROCESS FOR THE PYROGENIC MAKING OF HIGHLY DISPERSED SILICON DIOXIDE

Alfred Illigen, Lochau, Austria, and Walter Neugebauer, Konstanz, Germany, assignors to Deutsche Gold- Und Silber-Scheideanstalt vormals Roessler, Frankfurt am Main, Germany

Filed June 30, 1970, Ser. No. 51,180
Claims priority, application Germany, July 1, 1969, P 19 33 291.3
Int. Cl. C01b *33/18, 33/12, 33/00*
U.S. Cl. 23—182 V 13 Claims



Silicon dioxide or a material containing the same are reacted with a reducing agent at an elevated temperature. The hot gas containing the silicon monoxide thus formed is then treated with steam whereby a finely dispersed silane groups- and silanol groups-containing solid intermediate product is formed in the gas stream which is then subjected to chilling whereupon the major portion of the solid product is separated from the residual gas and is finally subjected to a thermal aftertreatment at about 100–1000° C.

3,674,431

GENERATION OF SILICON TETRAFLUORIDE

Richard E. Driscoll and George L. De Cuir, Monroe, La., assignors to Cities Service Company, New York, N.Y.

No Drawing. Filed July 1, 1970, Ser. No. 51,699
Int. Cl. C01b *33/08, 33/02*
U.S. Cl. 23—205 12 Claims

Silicon tetrafluoride is generated by passing a mixture of HF and water through a pervious bed of crystalline silica. A reaction mixture of SiF_4, HF and water is formed in the silica bed and is maintained in a vapor-liquid phase at about the dew point until the HF therein has substantially reacted with the silica. At the same time, the liquid of the reaction mixture undergoes vaporization by absorbing the heat of the reaction, and conditions are established and maintained to effect vaporization of the liquid at about the same rate that it is introduced into the bed. The reaction thus proceeds in both a liquid-solid phase and a vapor-solid phase at the same time to effect conversion of HF to SiF_4 at high efficiencies.

3,674,432

SUPERSTOICHIOMETRIC CARBON MONOFLUORIDE AND METHODS FOR PREPARING STABLE CARBON MONOFLUORIDES OF VARIOUS STOICHIOMETRIES

John L. Margrave, Houston, and Ramachandra B. Badachhape, Hempstead, Tex., James L. Wood, Nashville, Tenn., and Richard J. Lagow, Houston, Tex., assignors to R. I. Patents, Inc., Houston, Tex.

Filed Oct. 20, 1969, Ser. No. 867,678
Int. Cl. C01b *7/00*
U.S. Cl. 23—205 36 Claims

Stable carbon monofluoride having a maximum superstoichiometric fluorine-to-carbon ratio and controlled, re-

producible methods for preparing stable carbon monofluorides including carbon monofluoride films on various shapes of solid carbon, both at atmospheric pressure and at superatmospheric pressures. The prior method of preparing carbon monofluorides at atmospheric pressure by reacting fluorine and graphite at a temperature in the range from about 400° C. to about 600° C. is made reproducible by controlling the reaction temperature so that it does not vary more than ±3° C. Stable superstoichiometric carbon monofluorides can be prepared at atmospheric pressure by reacting carbon and fluorine at a temperature in the range from about 620° C. to about 635° C. and maintaining the temperature for such a period of time as to allow the reaction to go substantially to completion. Approximately one to three hours is needed at temperatures in this range to form stable carbon monofluoride films. At temperatures between about 624° C. and about 630° C. a carbon monofluoride having a maximum superstoichiometric fluorine-to-carbon ratio of approximately 1.12/1.00 can be produced. Stable carbon monofluorides having superstoichiometric proportions of fluorine and carbon can also be prepared at superatmospheric pressures, with the addition of heat at pressures up to about 225 p.s.i.a. and without the addition of heat at pressures between about 225 p.s.i.a. and about 250 p.s.i.a.

3,674,433

MODIFICATION OF FEEDSTOCK OIL WITH RUBBER IN CARBON BLACK PROCESS

Glenn O. Wyatt, Collinston, La., assignor to Cities Service Company, New York, N.Y.

No Drawing. Filed Sept. 21, 1970, Ser. No. 74,143
Int. Cl. C09c *1/48, 1/50*
U.S. Cl. 23—209.4 **7 Claims**

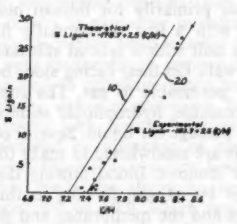
Old tire rubber is digested in a carbon black feedstock oil. The resulting modified oil is then thermally decomposed to produce carbon black which is recovered and incorporated into end-use products, e.g. new automobile tires. Disposal of old tires is thus accomplished without pollution of the atmosphere. The amount of rubber digested in the oil is in excess of about 10 weight percent and can range up to about 30 weight percent. The resulting modified feedstock oil can be effectively utilized to make carbon black while employing conventional pumping, metering, spraying and thermal decomposition means.

3,674,434

METHOD AND APPARATUS FOR DETERMINING LIGNIN CONTENT

Charles R. Pottenger, Cloquet, Minn., assignor to Potlatch Forests, Inc., San Francisco, Calif.

Filed July 28, 1970, Ser. No. 58,858
Int. Cl. G01m *33/46*
U.S. Cl. 23—230 R **6 Claims**



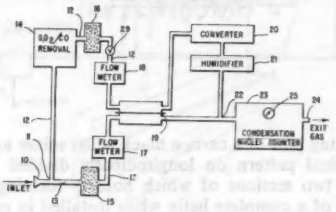
A method and apparatus for determining lignin content of wood or wood pulp by direct measurement. The process is based upon a theoretical relationship between lignin content and the ratio of elemental carbon to elemental hydrogen in a sample of wood material. It involves reduction of particle size as necessary for elemental analysis, washing of a sample, drying the sample to a predetermined moisture content and analysis of the sample to determine the elemental ratio of carbon to hydrogen. The lignin content of the sample is then determined according to a linear relationship. The apparatus comprises components chosen to carry out the method steps.

3,674,435

LOW CONCENTRATION CONSTITUENT OF GASEOUS MIXTURE SELECTIVE CONVERTER AND DETECTOR

Frank W. Van Luik, Jr., and Peter E. Coffey, Schenectady, N.Y., assignors to Environment/One Corporation, Schenectady, N.Y.

Filed June 5, 1970, Ser. No. 43,793
Int. Cl. G01n *31/02*
U.S. Cl. 23—232 R **18 Claims**



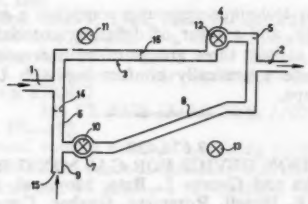
Accurate measurement of the concentration level of a first selected gaseous material in a sample atmosphere having present therein a second interfering gaseous material is obtained by selectively reducing the concentration of the second interfering gaseous material while maintaining the proportionate concentration level of the selected gaseous material at a measurable level. The selected gaseous material is then converted into condensation nuclei which in turn are measured to yield an accurate indication of the concentration of the selected gaseous material in the sample atmosphere.

3,674,436

EXHAUST GAS ANALYZER FOR INTERNAL COMBUSTION ENGINES

Herman R. Geul, Rossinistraat 12, Leiden, Netherlands

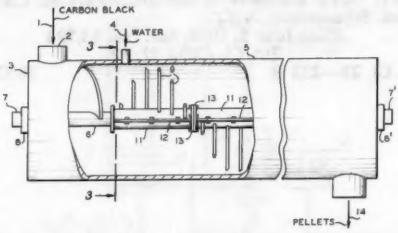
Filed Aug. 22, 1969, Ser. No. 852,300
Int. Cl. G01n *25/20, 25/36, 33/22*
U.S. Cl. 23—232 E **6 Claims**



An exhaust gas analyzer which combines the known measure of exhaust gases based upon the thermal conductivity of the exhaust gases and the known measure based upon the catalytical burning of the exhaust gases

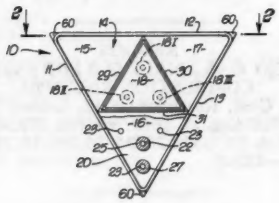
into a novel system, according to which the output signals obtained by these two measurements, made simultaneously, are subtracted from each other. This results in an analyzer which has an unequivocal indication in the region below and above the stoichiometrical point.

3,674,437
CARBON BLACK PELLET MIXER WITH SECTIONAL HELICAL-PIN MIXER
Oliver K. Austin, Bartlesville, Okla., and Bruno F. Loewen, Salvador, Brazil, assignors to Phillips Petroleum Company
Filed July 14, 1970, Ser. No. 54,696
Int. Cl. C01b *31/14*; C09c *1/58*
U.S. Cl. 23—252 R **4 Claims**



Agitating pins of a carbon black pellet mixer are affixed in a helical pattern on longitudinally divided sectional holders, two sections of which holders forming at least one half of a complete helix when installed in opposition to each other onto and around the drive shaft of the pellet mixer. Such sectional holders are quickly replaceable so as to minimize mixer downtime due to pin wear and necessary replacement.

3,674,438
OUCHTERLONY TECHNIQUE APPARATUS
James T. Shen, 940 Cornell Road, Pasadena, Calif. 91106
Filed May 20, 1970, Ser. No. 38,978
Int. Cl. B22c *9/22*; G01n *33/16*
U.S. Cl. 23—253 R **16 Claims**



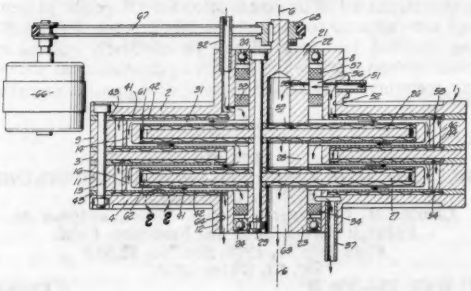
Ouchterlony technique apparatus comprises a generally triangular tray, and a layer of diffusing material in the tray forming at least three groups of wells arranged in a triangular pattern generally conforming with the tray triangular shape.

3,674,439
DETECTION DEVICE FOR GAS MIXTURES
Leo E. Hakka and George L. Bata, Montreal, Quebec, and John E. Hazell, Rosemere, Quebec, Canada, assignors to Union Carbide Canada Limited, Toronto, Ontario, Canada
Filed July 10, 1970, Ser. No. 53,763
Int. Cl. G01n *31/06*; G08b *21/00*
U.S. Cl. 23—254 R **14 Claims**

A device for detecting a component in a gas mixture consists of a strip of two layers laminated together, one layer being a better solvent for the gas component than the other and each being effectively a non-solvent for the other components in the mixture, a support means for securing one end of the strip and a recording means at the free end of the strip for recording a deflection in the strip due to the lateral expansion of the solvent layer with

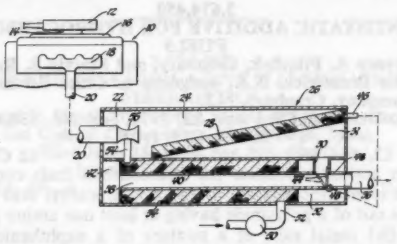
respect to the non-solvent layer. Also described in the embodiment wherein the ratio of two components in the gas mixture may be determined by means of a device wherein the strip consists of two layers one of which is a solvent for one component and the other layer is a solvent for the second component.

3,674,440
OXYGENATOR
Sotiris S. Kitrilakis, Newton, Mass., assignor to Tecna Corporation
Filed May 7, 1970, Ser. No. 35,401
Int. Cl. A61m *1/03*
U.S. Cl. 23—258.5 **8 Claims**



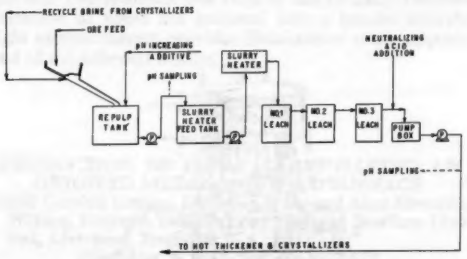
An oxygenator primarily for human blood has a first stationary unit with a first substantially flat wall and a second movable unit with a second substantially flat wall facing the first wall. On their facing sides both walls have supports highly permeable to gas. The supports are covered by gas permeable, hydrophobic membranes between them defining a passage for liquid. Several of the first units and second units are sandwiched to make the passage long and tortuous or sinuous. Blood flowing through the passage is perfused by oxygen flowing in through the permeable supports and the membranes and gives up carbon dioxide flowing out through the membranes and supports. The gas transport into and out of the blood is enhanced by rotating the units relative to each other. This produces fairly regular vortical motion of the blood and reduces the thickness of the boundary layer of the blood.

3,674,441
EXHAUST EMISSION CONTROL
Edward N. Cole, Bloomfield Hills, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Nov. 9, 1970, Ser. No. 87,743
Int. Cl. F01n 3/14; B01j 9/04
U.S. Cl. 23—288 F 7 Claims



Internal combustion engine exhaust gases, passing unconverted through an exhaust gas catalytic converter during the warm-up period of the catalyst bed, are directed to a bed of storage material which separates and retains undesirable constituents of the exhaust gases. After warm-up of the catalyst bed, the retained constituents are purged from the storage bed and recirculated to and converted in the catalyst bed. The storage bed supplements the emission control of the catalyst bed by reducing emission of undesirable exhaust gas constituents during starting of the engine and warm-up of the catalyst bed.

3,674,442
CONTROL OF ORGANIC DEPOSITION IN SLURRY HEATERS IN POTASH CRYSTALLIZER CIRCUIT
Stephen M. Nielson, Provo, Utah, assignor to Texas Gulf Sulphur Company, New York, N.Y.
Filed May 20, 1969, Ser. No. 826,195
Int. Cl. B01d 9/02; C01d 3/08; C23f
U.S. Cl. 23—299 4 Claims



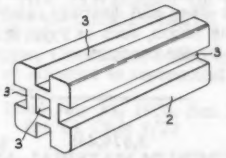
In the production of potash from aqueous slurries of ores such as sylvite in their transit through a potash crystallization circuit including slurry heaters which receive the slurry from a feed tank connected to the repulp tanks, a deposition of undesirable deposits from material existing in the ore occurs as a coating in these slurry heaters which materially decreases heat transfer therein so that it is necessary very frequently to remove the slurry heaters for cleaning and to substitute spare heaters, resulting in economic loss by virtue of downtime, labor and duplication of equipment with resultant increased production cost. This is avoided by adjusting or elevating the pH value of the crystallizer liquor slurry feed stream in the repulp tank that feeds the slurry heater feed tank to range from about 9.0 to 10.0, which results in suppressing formation of undesirable deposits in the slurry heaters and elsewhere. Subsequently, the returning brine stream flowing to a hot thickener is acidified to reduce its pH value to normal value of approximately 7.5 prior to recycling.

3,674,443
TITANIUM CARBIDE-NICKEL COMPOSITIONS
Alma U. Daniels, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
No Drawing. Filed May 28, 1969, Ser. No. 828,699
Int. Cl. B22f 3/14
U.S. Cl. 29—182.8 4 Claims

Dense, homogeneous compositions having (a) a density in excess of 95% of theoretical and (b) an average grain size less than 10 microns and consisting of:

(1) 80–97 percent by volume of titanium carbide and
(2) 3–20 percent by volume of nickel, the nickel being present mainly as a binder phase uniformly distributed at the grain boundaries, are useful as cutting edges for cutting tools.

3,674,444
IRON SCRAP BUNDLES
Akemasa Otani, 4, 2-chome, Asakusa Hashiba-cho, Taito-ku, Tokyo, Japan
Filed Sept. 22, 1966, Ser. No. 581,288
Claims priority, application Japan, Mar. 7, 1966, 41/13,687; Mar. 28, 1966, 41/18,709
Int. Cl. B21c 37/00
U.S. Cl. 29—186 7 Claims



A scrap iron bundle adapted to be introduced into a melting furnace. The bundle comprises a body formed from a plurality of iron scraps compacted together, the body having hollows therein which increase the area of heat transfer and promote melting of the bundle.

3,674,445
VAPOR DEPOSITED ZINC COATED METALLIC SUBSTRATES HAVING ORGANIC COATINGS
Stanley Thaddeus Wlodek, Bethel Park, Pa., assignor to Jones & Laughlin Steel Corporation, Pittsburgh, Pa.
Filed May 13, 1968, Ser. No. 728,631
Int. Cl. B23p 3/00
U.S. Cl. 29—195 8 Claims

Metallic substrates are provided with adherent surface finishes of paints, lacquers, plastics and the like by the use of intermediate adherence-promoting vacuum vapor deposited zinc coatings.

3,674,446
ELECTRICAL CONTACT MATERIAL
Fredrik O. Haarbye and Peter C. Murphy, Indianapolis, Ind., assignors to P. R. Mallory & Co., Inc., Indianapolis, Ind.
Application Dec. 9, 1966, Ser. No. 600,621, now Patent No. 3,545,067, which is a continuation-in-part of application Ser. No. 445,038, now Reissue Patent No. 27,075. Divided and this application Oct. 13, 1969, Ser. No. 870,837
Int. Cl. B32b 15/04; H01h 1/02
U.S. Cl. 29—195 22 Claims

Electrical contact material consisting essentially of silver and cadmium oxide is disclosed wherein the material is characterized by having a pre-oxidized microstructure wherein there is a fine cadmium oxide particle size and a substantially uniform distribution of cadmium oxide throughout the material including the core. The material has a lower arc erosion rate than post oxidized material of the same composition when tested under similar conditions. A backing, for example of fine silver may be provided for the contact material.

3,674,447

NICKEL OR COBALT WEAR-RESISTANT COMPOSITIONS AND COATINGS

Harold Edward Bellis, Hockessin, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Aug. 4, 1969, Ser. No. 847,457
Int. Cl. B23p *3/00*; C23c *3/02*
U.S. Cl. 29—196.6 18 Claims

Metallic compositions and substrates coated therewith having improved wear resistance and other properties are provided. In a preferred embodiment, the coating comprises an intimate dispersion of hard nickel-boride (Ni_3B) or nickel phosphide (Ni_3P) in a soft matrix of nickel and thallium. The coating is prepared by chemical reduction of nickel and thallium salts using borohydrides such as sodium borohydride and dimethylamine borane (DMAB) or sodium hypophosphite. The proportions of the metals in the preferred coating are about 99.4 to 82 percent by weight nickel, about 0.1 to 12 percent by weight boron or phosphorus and about 0.5 to 6 percent by weight thallium. Cobalt can be used as well as the preferred nickel. In the metallic compositions, abrasion-resistant particles such as metal carbides can be present in the soft matrix of nickel and thallium. The coating can be heat-treated at 300 to 500° C. to achieve optimum metallurgical structure. Shaped structures subject to wear, such as piston rings and bearings, and structures subjected to cutting action, such as twist drills, are particularly benefited by the coatings.

3,674,448

ANODIC ALUMINUM MATERIAL AND ARTICLES AND COMPOSITE ARTICLES COMPRISING THE MATERIAL

Robert H. Brown, Natrona Heights, William A. Anderson, Pittsburgh, and William King, Lower Burrell, Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

No Drawing. Filed Apr. 21, 1969, Ser. No. 818,145
Int. Cl. B23p *3/02*
U.S. Cl. 29—197.5 9 Claims

An article comprising an anode material composed of a solution heat treatable and precipitation hardenable aluminum base alloy consisting essentially of 2 to 8% zinc, 0.5 to 2% magnesium, 0.3 to 2% silicon, the silicon content amounting to at least 0.45 times the magnesium content, the balance being aluminum and incidental elements and a maximum of 0.25% copper and a maximum of 0.25% chromium, as impurities, the member exhibiting a stable solution potential upon exposure to varying thermal conditions. Also contemplated is a composite having a cladding composed of the material and a heat treatable aluminum alloy core.

3,674,449

PROCESS OF BRIQUETTING FINE-GRAINED COKES WITH CAKING COAL IN A PLASTIC STATE

Paul Schmalfeld, Bad Homburg, Heinrich Janssen, Wachebuchen-Hohe Tanne, Burkhard Bock, Duisburg, Werner Peters, Wattenscheid, and Erwin Ahland, Essen, Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, and Bergwerks-Verban, Essen-Kray, Germany

Filed May 21, 1970, Ser. No. 39,205
Claims priority, application Germany, Aug. 23, 1969, P 19 42 957.3
Int. Cl. B30b *1/00*; C10l *5/00*
U.S. Cl. 44—10 R 13 Claims

In the briquetting of coke, including mixing coke with plastic-form caking coal to form a mixture at a temperature sufficiently high to maintain the plastic state of the caking coal, and forming the mixture into briquettes; the improvement obtained by holding the mixture at the preselected high temperature for 20 to 300 seconds under conditions such that the mixture is maintained in a stirred layer 50 to 200 centimeters thick.

3,674,450

ANTISTATIC ADDITIVE FOR HYDROCARBON FUELS

Lawrence A. Filachek, Cranbury, and Marvin S. Rakow, East Brunswick, N.J., assignors to Cities Service Oil Company, Cranbury, N.J.

No Drawing. Filed Apr. 23, 1971, Ser. No. 136,993
Int. Cl. C10l *1/26*
U.S. Cl. 44—66 12 Claims

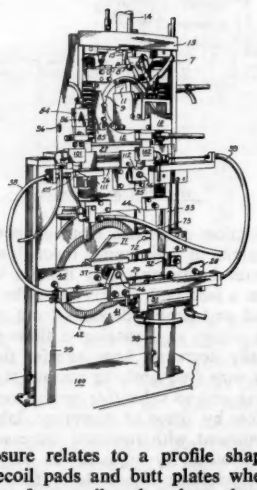
An antistatic additive for hydrocarbon fuels comprising a synergistic mixture of (a) a hydrocarbyl acid phosphate salt of a polyamide having at least one amino group and (b) metal salts of a mixture of a naphthenic acid and an alkanoic acid wherein the metal is a mixture of a Group II*a* metal and a transition metal selected from the group consisting of iron, cobalt, nickel, copper, and zinc and, preferably, a monohydrocarbyl ether of a glycol; and hydrocarbon fuel compositions containing said antistatic additive. The hydrocarbon fuel compositions of this invention comprise a major proportion of the hydrocarbon fuel and a minor proportion of the antistatic additive. The preferred hydrocarbon fuels are distillate fuels such as No. 1 fuel, No. 2 fuel, diesel fuel, and turbine fuel.

3,674,451

PROFILE SHAPING MACHINE FOR FIREARM RECOIL PADS AND BUTT PLATES

Harold L. Hameister, Richfield Springs, and Andrew R. Baszczuk, Newport, N.Y., assignors to Remington Arms Company, Bridgeport, Conn.

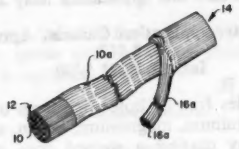
Filed Jan. 25, 1971, Ser. No. 109,264
Int. Cl. B24b *5/26*, *17/08*, *21/02*
U.S. Cl. 51—127 17 Claims



This disclosure relates to a profile shaping machine for firearm recoil pads and butt plates wherein the surface periphery of a recoil pad or butt plate is sized and shaped to conform to the peripheral surface of the butt end of the finished firearm. An oversized and unshaped recoil pad or butt plate is secured to the butt end of the finished stock to form an assembly, and placed in the machine. The machine rotates this assembly through approximately 360 degrees to cut the basic profile. In

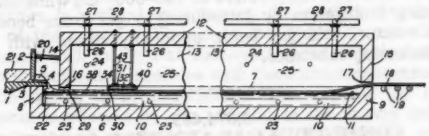
timed relationship to the rotational aspect, the workpiece is tilted with respect to the shaper to accommodate for the changes in the longitudinal angles of the stock. Each stock is positioned upon a limiting tracer plate which controls the depth of the cut of the recoil pad or butt plate with respect to the stock.

3,674,452
METHOD OF FABRICATING ILLUMINATED FIBER OPTICS
Richard R. Strack, Sturbridge, Mass., assignor to American Optical Corporation, Southbridge, Mass.
Filed June 25, 1970, Ser. No. 49,876
Int. Cl. C03c *23/20, 15/00*
U.S. Cl. 65—4 **9 Claims**



Illuminated image transporting fiber optics are fabricated by first forming a coherent bundle of optical fibers, the ends of the bundle being arranged in identical geometrical patterns and bound together with an acid leachable silica-free glass. A thickness of fibers is removed from one end of the coherent bundle whereupon remaining fibers at that end and the entire opposite end of the bundle are sealed with an acid resistant cover. The intermediate uncovered parts of the bundle are leached to simultaneously free corresponding intermediate lengths of the fibers and ends of the fibers of said partially removed thickness thereof. The resulting free ends of the partially removed thickness of fibers are gathered into a bundle whereby light applied thereto provides illumination at the opposite end of the coherent bundle.

3,674,453
PRODUCTION OF FLOAT GLASS HAVING AN OXIDIZED METAL-MODIFIED SURFACE
David Gordon Loukes, Eccleston Park, and Alan Edwards, Widnes, England, assignors to Pilkington Brothers Limited, Liverpool, England
Filed Aug. 5, 1969, Ser. No. 847,629
Claims priority, application Great Britain, Aug. 16, 1968, 39,367/68
Int. Cl. C03c *17/00*; C03b *19/00*
U.S. Cl. 65—30 **10 Claims**



Desired characteristics, for example a desired colour, are imparted to float glass by the dissolving of a metal oxide as a uniform and continuous surface stratum in a face of the glass by directing a metal compound in vapour form on to the hot glass surface under oxidising conditions such that oxidation is promoted only at the glass surface resulting in solution of metal oxide into a surface layer of the glass.

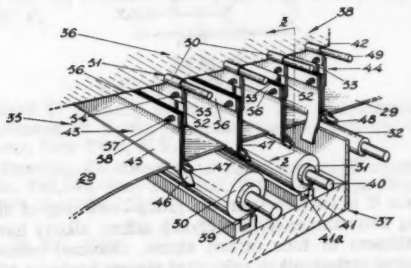
3,674,454
ION EXCHANGE OF GLASS WITH USE OF CARBON DIOXIDE
Elime Plumat, Gilly, and Francois Toussaint, Lodelinsart, Belgium, assignors to Glaverbel S.A., Watermael-Boitsfort, Belgium
No Drawing. Filed Sept. 12, 1969, Ser. No. 857,567
Claims priority, application Luxembourg, Sept. 12, 1968, 56,873/68
Int. Cl. C03c *21/00*
U.S. Cl. 65—30 **9 Claims**

In order to improve the repeatability and reaction speed of processes for modifying a property of a glass, vitrocrystalline, ceramic, or stone body by diffusing at least one substance into the body from a contacting treatment medium containing a molten nitrate salt, CO_2 is brought into contact with such medium during the diffusion operation.

3,674,455
PROCESS FOR THE SYNTHESIS OF GLASS AND SINGLE CRYSTAL GERMANATES OF IDENTICAL COMPOSITION
Cortland O. Dugger, Cambridge, Mass., assignor to the United States of America as represented by the Secretary of the Air Force
No Drawing. Filed July 31, 1970, Ser. No. 60,140
Int. Cl. C03c *3/22*
U.S. Cl. 65—134 **2 Claims**

A process for forming germanate compositions from a starting mixture in which the concentration ratio limits of the oxygen ions to germanium ions is from 2.0:1 to 3.0:1; that is, $2.0{:}1 \leq O{:}Ge \leq 3.0{:}1$. The germanate compositions within the above limits include germanate glasses and germanate single crystals of identical composition. Specifically, the process involves the steps of intimately mixing appropriate quantities of sodium oxide and germanium oxide followed by the steps of heating the mixture to a temperature within the range of from about 1050° to 1525° C. with subsequent controlled cooling to room temperature.

3,674,456
EXIT SEALING DRAPE FOR FLOAT GLASS BATH
Francis L. Swillinger, Perrysburg, Ohio, assignor to Libbey-Owens-Ford Company, Toledo, Ohio
Filed Feb. 25, 1970, Ser. No. 14,002
The portion of the term of the patent subsequent to Sept. 21, 1988, has been disclaimed
Int. Cl. C03b *18/02*
U.S. Cl. 65—182 R **6 Claims**



Sealing the exit passageway of the plenum chamber enclosing the special atmosphere of a float glass apparatus

for the production of glass having exceptional surface quality such as mirror glass, including a special closure drape swingably mounted in the passageway and having a first layer of a flexible, lubricating fibrous carbon material, harmless to the mirror finish of the glass ribbon and of sufficient length that the continuous passage of the glass ribbon below causes a segment of the free end thereof to be dragged in a horizontal direction thereon. A second layer which inhibits the passage of gas is suspended behind the first layer with its lower end supported on the horizontal segment of the first layer.

3,674,457
CONTROL OF MICROORGANISMS IN INDUSTRIAL PROCESS WATERS
Leonard L. Wolfson, Milwaukee, Wis., assignor to Nalco Chemical Company, Chicago, Ill.
No Drawing. Continuation-in-part of abandoned applications Ser. No. 454,986, May 11, 1965, and Ser. No. 770,785. This application Nov. 2, 1970, Ser. No. 86,368
Int. Cl. A01n *9/00, 9/18, 23/00*
U.S. Cl. 71—67 **1 Claim**

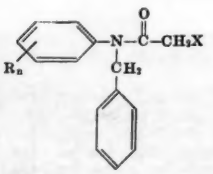
Method of inhibiting the growth and reproduction of microbiological organisms in industrial process water systems by treating said system with a microbiocidal composition consisting of methylenebisthiocyanate and formaldehyde combined in a weight ratio of from 1:5 to 1:10.

3,674,458
METHOD FOR REGULATING PLANT GROWTH
Robert I. Schattner, 4000 Masachusetts Ave. NW., Washington, D.C. 20016
No Drawing. Filed Jan. 28, 1969, Ser. No. 794,800
Int. Cl. A01n *21/02*
U.S. Cl. 71—77 **6 Claims**

A method of regulating the growth of plants involving the treating of the seeds with an aqueous solution comprising sodium phenolate, sodium tetraborate, phenol and a humectant, before planting.

3,674,459
PHYTOTOXIC COMPOSITIONS
Gerhard H. Alt, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.
No Drawing. Filed June 30, 1969, Ser. No. 837,893
Int. Cl. A01n *9/20*
U.S. Cl. 71—18 **15 Claims**

Herbicidal use, especially for barnyard grass in the presence of rice, of a compound of the formula



wherein R is selected from the group consisting of alkyl having a maximum of four carbon atoms, alkoxy having a maximum of four carbon atoms, chlorine, bromine, nitro and carboxyalkyl, said alkyl moiety having a maximum of four carbon atoms; X is selected from the group consisting of chlorine and bromine; and *n* is one of the integers 1 to 3.

3,674,460
HERBICIDAL USE OF SUBSTITUTED o-PHENYLENEDIAMINES
Robert K. Howe, Bridgeton, Mo., assignor to Monsanto Company, St. Louis, Mo.
No Drawing. Filed Nov. 5, 1969, Ser. No. 874,385
Int. Cl. A01n *9/20*
U.S. Cl. 71—121 **9 Claims**

Herbicidal use of substituted alkyl o-phenylenediamines which are produced by reacting a substituted benzimidazole with an alkylating agent.

3,674,461
HOLLOW SPHERICAL ARTICLES
Joseph Redmond Farnand and Ira Edwin Puddington, Ottawa, Ontario, Canada, assignors to Canadian Patents and Development Limited, Ottawa, Ontario, Canada
No Drawing. Original application Apr. 7, 1966, Ser. No. 540,807, now Patent No. 3,528,809, dated Sept. 15, 1970. Divided and this application May 21, 1970, Ser. No. 39,901
Claims priority, application Canada, Apr. 15, 1965, 928,412
Int. Cl. B22f *5/00*
U.S. Cl. 75—.5 R **3 Claims**

Hollow articles free of holes or seams of a metal selected from aluminum, magnesium, boron, and beryllium are provided by coating a shaped core of a material transformable directly into gas with flakes or particles of the metal, slowly removing the core material through the particulate coating in gaseous form, and consolidating the coating (e.g. by fusing or sintering). Coatings of these metals cannot be satisfactorily prepared by reduction of their salts in solution. Small spheres of a diameter less than 0.2 inch (especially 0.005 to 0.06 inch) are of particular interest.

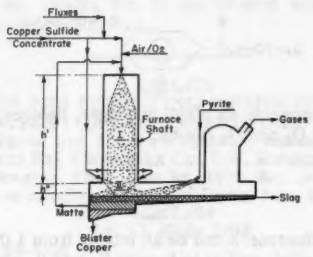
3,674,462
PROCESS FOR LOW TEMPERATURE CHLORINATION OF ROASTED PRODUCTS FROM AN IRON SULPHIDE ROASTING PROCESS PRIOR TO LEACHING OUT THE NONFERROUS METAL PRESENT THEREIN
Karl Goran Gorling, Lidingo, Sweden, assignor to Boliden Aktiebolag, Stockholm, Sweden
Filed Nov. 21, 1969, Ser. No. 878,851
Claims priority, application Sweden, Dec. 31, 1968, 18,068/68
Int. Cl. C22b *1/10*
U.S. Cl. 75—9 **5 Claims**

A process for roasting sulphidic iron material or mixtures of sulphidic and oxidic iron material and chlorinating nonferrous metals present in said materials at low temperatures, whereafter the chlorinated nonferrous metals are leached out and recovered, in which the material is first roasted in a fluidized bed reactor at a temperature between 700 and 1100° C., while introducing oxygen or a gas containing free oxygen in a limited amount, whereafter the material, subsequent to desulphurizing and cooling is treated with chlorine, hydrogen chloride or iron chloride or a gas containing chlorine or hydrogen chloride, in a fluidized bed reactor at a temperature of 300–600° C., while maintaining fluidization by introducing a gas from beneath the reactor, said gas being optionally mixed with the chlorinating substance.

3,674,463
CONTINUOUS GAS-ATOMIZED COPPER SMELTING AND CONVERTING
John C. Yannopoulos, Danbury, Conn., assignor to Newmont Exploration Limited, Danbury, Conn.
Filed Aug. 4, 1970, Ser. No. 60,793
Int. Cl. C22b *9/10, 15/06*
U.S. Cl. 75—72 **4 Claims**

A process for smelting copper sulfide concentrates and simultaneously converting the thus-produced matte to

form blister copper, slag and an effluent gas unusually rich in sulfur dioxide is characterized by continuous operation in which both smelting and converting are carried out in



suspension over a common furnace hearth body of molten blister copper, matte and slag from which the matte to be converted is supplied.

3,674,464

PROCESS FOR REMOVING COPPER FROM MOLYBDENUM

Vincent Chiola, Towanda, and Phyllis R. Dodds, Wysox, Pa., assignors to GTE Sylvania Incorporated

No Drawing. Filed Mar. 27, 1970, Ser. No. 23,446

Int. Cl. C22b *49/00*

U.S. Cl. 75—101 R 5 Claims

A process for removing copper from molybdenum is disclosed that comprises forming an aqueous solution containing molybdenum and copper having a pH of above about 5.7. contacting the solution with an α-hydroxy oxime organic solution to extract the copper into the organic phase without the extraction of molybdenum and recovering the molybdenum. Additionally the copper can also be recovered as a copper salt of a mineral acid.

3,674,465

RECOVERY OF NICKEL FROM NICKEL AMMONIUM CARBONATE SYSTEMS

David J. I. Evans, North Edmonton, Alberta, and Donald Robert Weir, North Saskatchewan, Alberta, Canada, assignors to Sherritt Gordon Mines Limited, Toronto, Ontario, Canada

No Drawing. Filed May 6, 1970, Ser. No. 35,273

Claims priority, application Canada, Oct. 16, 1969, 65,004

Int. Cl. C22b *23/04*

U.S. Cl. 75—108 7 Claims

Contamination of product nickel produced by direct hydrogen reduction from nickel bearing aqueous ammonium carbonate systems by zinc and other undesirable metal impurities is avoided by adjusting the sulphate ion content of the system subjected to the hydrogen reduction treatment such that it is at least equal to the stoichiometric amount required to combine with the contaminant metals in the system to form sulphates. The sulphate ion adjustment is effected by the addition to the system prior to reduction of a sulphate compound, for example, ammonium sulphate, which will dissolve in the system and form soluble sulphates with the contaminate metals but which will not add cations to the system which will precipitate with and contaminate the nickel powder produced in the subsequent hydrogen reduction step. The sulphate ion content may also be adjusted by providing oxidizable sulphur values in the system and reacting the system with oxygen at elevated temperature and pressure to convert the added sulphur values to sulphate form.

3,674,466

REMOVAL OF COPPER FROM AQUEOUS SOLUTIONS WITH HIGHLY STRESSED, ACTIVATED FERROUS METALS

John Ray Anderson, Cranbury, N.J., and Richard Peck Hollingworth, Yardley, Pa., assignors to Sybron Corporation, Rochester, N.Y.

Filed May 18, 1970, Ser. No. 38,018

Int. Cl. C22b *15/12*

U.S. Cl. 75—109 15 Claims

The removal of copper from aqueous copper-containing solutions is accomplished by passing an aqueous copper-containing solution at a pH of about 6.5 to 10.5 through a column containing a highly stressed form of ferrous metal which has been activated by treatment first with a degreasing agent and then with an inorganic acid. A ferrous metal complexing agent added to the aqueous copper-containing solution prior to passage through the column of metal prevents ferrous ion precipitation in the treated solution.

3,674,467

NON-RIDGING CHROMIUM STAINLESS STEEL

David L. Chalk, Monroe, Ohio, assignor to Armco Steel Corporation, Middletown, Ohio

No Drawing. Filed July 23, 1969, Ser. No. 844,213

Int. Cl. C22c *39/16;* C21d *9/48*

U.S. Cl. 75—126 R 5 Claims

Non-ridging ferritic chromium stainless steel, such as A.I.S.I. Type 430, produced by steps which comprise selecting a chemistry containing a maximum of 0.01% carbon, and processing the selected steel into finished strip form by a procedure which may include a normalizing treatment above the critical transformation temperature.

3,674,468

HIGH-STRENGTH SILICON STEEL

Kelichi Ota, 54 Nakagawara-cho, Sakyo-ku, Kyoto, Japan

No Drawing. Continuation-in-part of application Ser. No. 708,530, Feb. 27, 1968. This application Nov. 23, 1970, Ser. No. 92,144

Int. Cl. C22c *39/20, 39/44*

U.S. Cl. 75—128 A 4 Claims

A high-strength silicon steel consisting of less than 0.03% C, 4–6% Si, 5–10% Ni, 6–18% Cr, less than 4% each of Mn, Mo and Cu, less than 2% V and residue essentially Fe, in which the total amount of Ni and Mn is varied so as to approach 2 times the Si content and the Cr varied about 2.5 times of the Si content, so that the Ac_3 transformation point is lowered to less than 1400° F.

3,674,469

WELDING ELECTRODE

Richard C. Stewart, Edwardsville, Ill., and Edward L. Creamer, St. Louis, Mo., assignors to Shell Oil Company, New York, N.Y.

No Drawing. Continuation of abandoned application Ser. No. 733,294, May 31, 1968. This application Dec. 30, 1970, Ser. No. 102,995

Int. Cl. C22c *37/10*

U.S. Cl. 75—124 4 Claims

The present invention relates to an improved method of welding 10–20% chromium stainless steels with a new and novel matching welding electrode containing from about 0.1% to about 5% titanium.

3,674,470

VANADIUM BASE ALLOYS CONTAINING NIOBIUM AND TITANIUM

Hans-Jurgen Rainer Laue and Horst Otto Bohm, Karlsruhe, and Bernhard Hermann Reddemann, Werdohl-Barenstein, Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Filed Aug. 8, 1968, Ser. No. 751,242
Int. Cl. C22c *27/00*
U.S. Cl. 75—134 V 7 Claims

Alloys composed of 12–25%, preferably, 14–16% of niobium, 1 to less than 3%, preferably, 2.6–2.9%, of titanium, up to ½ of the titanium being replaceable with zirconium and/or hafnium, not more than 1% of carbon, nitrogen and oxygen, up to 1.5% of silicon and the remainder vanadium, said alloys having high corrosion resistance remaining stable over long periods of time at temperatures between 500 and 800° C. and having utility as construction materials in nuclear reactors, especially those having cooling systems using molten alkali metals, space vehicles and chemical apparatus.

3,674,471

ALLOY

A. David Joseph, New Canaan, Conn., assignor to Eutectic Corporation, Flushing, N.Y.

No Drawing. Filed Apr. 9, 1970, Ser. No. 27,138
Int. Cl. C22c *9/02, 9/06*
U.S. Cl. 75—153 1 Claim

A copper base alloy with silver, phosphorus and tin additions that has self wetting properties that permit deposition by welding upon aluminum bronze and manganese bronze type base metals.

3,674,472

METHOD FOR PRODUCING IRON BASE SINTERED ALLOYS CONTAINING COPPER

Takashi Kimura, Nagoya-shi, Azusa Majima, Showa-ku, and Hiroshi Hamamoto and Yoji Awano, Nagoya-shi, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Nogoya-shi, Japan

Filed June 6, 1969, Ser. No. 831,088
Claims priority, application Japan, June 18, 1968, 43/42,089
Int. Cl. B22f *3/16*
U.S. Cl. 75—221 3 Claims

This invention relates to sintered metal alloys such as iron base alloys containing copper having significantly improved toughness characteristics, and a method for making such alloys. A novel structure is produced characterized by a non-homogeneous concentration of copper solid solution within the individual base metal particles comprising said sintered structure. Such a structure is obtained by controlling the time-temperature parameters during the sintering and diffusing steps thereof. For example, sintering is performed at a temperature less than the melting point of copper; the diffusion at a temperature ranging from the melting point of copper to less than the melting point of the iron base material.

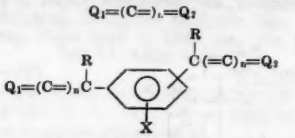
3,674,473

CUMULENE CONTAINING PHOTOCONDUCTIVE BINDER ELEMENTS FOR USE IN ELECTROPHOTOGRAPHY

Robert G. Blanchette, Elk Grove, Ill., assignor to Addressograph-Multigraph Corporation, Cleveland, Ohio

No Drawing. Continuation-in-part of application Ser. No. 771,352, Oct. 28, 1968. This application Oct. 6, 1970, Ser. No. 78,628
Int. Cl. G03g *5/06*
U.S. Cl. 96—1.5 9 Claims

A photoelectrostatic member is prepared by applying a photoconductive layer containing a compound selected from the general class of cumulenes dispersed in a resin binder. The cumulene compounds useful in the instant invention have one of the following general formulas:



where X represents an alkyl, hydrogen, halogen, or nitro substituent; Q_1 and Q_2 can be:

indene, or fluorene; *n* can be an integer from 1 through 6; R is lower alkyl, aryl or hydrogen; R_1 and R_2 can be aryl, substituted aryl, heterocyclic ring structures; and wherein Q_1, Q_2, or R_1, and R_2 can be the same or different.

3,674,474

LIGHT-SENSITIVE SHEET FOR USE IN ELECTROPHOTOGRAPHY

Junji Kurokawa, Fumiaki Arai, and Noriyuki Usui, Kanagawa-ken, Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

No Drawing. Filed Sept. 29, 1970, Ser. No. 76,642
Claims priority, application Japan, Sept. 30, 1969, 44/77,917; Oct. 6, 1969, 44/79,191
Int. Cl. G03g *5/10*
U.S. Cl. 96—1.5 4 Claims

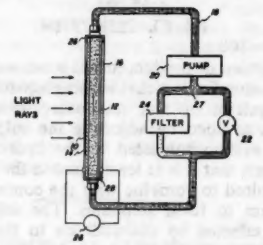
A light-sensitive sheet for use in electrophotography comprising a support one side of which is provided with an electroconductive layer while the opposite side is provided with a precoat layer and a superposed photoconductive layer. The precoat layer contains a water soluble high molecular weight substance having at least one hydroxyl or carboxyl functional group; a water dispersible resin; and a polymer which is at least one of N-methylol acrylamide polymers, a copolymer of N-methylol acrylamide and a vinyl monomer or a copolymer of polyethylene tetramine, adipic acid, urea and formaldehyde.

3,674,475

ENCLOSED MIGRATION IMAGING SYSTEM

Morton Silverberg, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Original application July 19, 1968, Ser. No. 746,177. Divided and this application Mar. 16, 1971, Ser. No. 124,840
Int. Cl. G03g *13/00*
U.S. Cl. 96—1.3 2 Claims



A display system which responds to a light image to form a viewable image. The system is sealed and is filled with a fluid carrying a dilute suspension of electrically photosensitive particles between two conductive plates. If an image is focused onto the space between the plates and a voltage established therebetween, the particles in contact with the inner surface of the conductive plate will

migrate from light struck areas of the plates. After the fluid has been circulated for an appropriate time after imaging, the fluid circulation is directed through a filter, which replaces the fluid between the plates with fluid having the undeposited particles removed. Various provisions for viewing the images formed within the display system are described.

3,674,476
PROCESS FOR PRODUCING PHOTOCONDUCTIVE LAYER FOR ELECTROPHOTOGRAPHY
Yasuo Tamai and Hajime Miyazuka, Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
No Drawing. Filed June 16, 1970, Ser. No. 46,826
Claims priority, application Japan, June 18, 1969, 44/47,624
Int. Cl. G03g *5/08*
U.S. Cl. 96—1.8 **6 Claims**

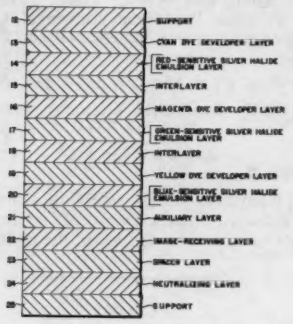
A process of producing a photoconductive element for electrophotography which comprises heating zinc hydroxide or basic zinc carbonate in the presence of water and under elevated pressure to obtain zinc oxide, dispersing the zinc oxide into an appropriate insulating resin and applying the dispersion onto an electroconductive support material.

3,674,477
ELECTROPHOTOGRAPHIC REPRODUCTION SHEET AND COMPOSITION CONTAINING PHOTOCONDUCTIVE MATERIAL AND COARSE FILLER PARTICLES
Lee Allen Carlson, Southboro, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.
No Drawing. Filed July 29, 1970, Ser. No. 59,365
Int. Cl. G03g *5/04, 7/00*
U.S. Cl. 96—1.8 **25 Claims**

An electrophotographic paper made to similate a good grade of bond paper by embedding in the electrophotographic layer, discrete solid, water-insoluble, relatively non-photoconductive (compared to photoconductive zinc oxide), relatively coarse (compared to the particles of zinc oxide photoconductor) filter particles of irregular shape, preferably a mineral or mixture of minerals, having at least one cross-sectional dimension not substantially less than 5, more preferably not substantially less than 10, microns but having a maximum particle size of 50 or 60 microns. These filler particles protrude from the electrophotographic surface to sharply decrease the smoothness of texture thereof (increase roughness and friction) and the slimy, leaden quality of the paper to provide for the first time an electrophotographic paper similating a good bond paper. Also, since the filler replaces part of the zinc oxide photoconductor per unit volume of electrophotographic layer and is only a fraction of the cost of the zinc oxide, the cost of the paper is substantially reduced. Furthermore, since the filler is less dense than the zinc oxide and is irregular in shape, it has a fluffing effect and decreases the weight per unit volume of the electrophotoconductive layer and increases the bulk of such layer. Furthermore, the filler increases the stiffness of the sheet, i.e., decreases the limpness thereof, to further similate a good grade bond paper. Accordingly, the sheet is easier to handle and to file.

3,674,478
NOVEL PRODUCTS AND PROCESSES
J. Michael Grasshoff, Hudson, and Lloyd D. Taylor, Lexington, Mass., assignors to Polaroid Corporation, Cambridge, Mass.
Filed Dec. 17, 1970, Ser. No. 99,067
Int. Cl. G03c *1/48, 5/54, 7/00*
U.S. Cl. 96—3 **44 Claims**

Integral negative-positive film units adapted for forming color transfer images, which film units include a novel compound which releases a "development restrainer" in the presence of alkali and which may be defined as a



quinone- or naphthoquinone-methide precursor containing a development restrainer moiety.

3,674,479
PHOTOGRAPHIC DRY COPYING PROCESS
Helmut Kampfer, Cologne, Anita von Konig, Erwin Ranz, Harald von Rintelen, and Dietmar Mayer, Leverkusen, and Klaus Sasse, Cologne, Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany
No Drawing. Filed Mar. 26, 1970, Ser. No. 23,035
Claims priority, application Germany, Apr. 14, 1969, P 19 18 751.0
Int. Cl. G03c *5/04*
U.S. Cl. 96—27 **13 Claims**

Photographic prints can be produced by imagewise exposure of a light-sensitive layer containing a transferable image producing compound and a light-sensitive compound capable of reacting upon exposure with an image producing compound to yield a non-transferable reaction product. The exposed layer is heated and contacted with an image receiving layer containing compounds capable of reacting with the heat transferred image producing compound to form the image dye.

The light-sensitive compound is an organic azido compound and the image producing transferable compound, a compound of the phenol- or naphthol series.

3,674,480
PHOTOGRAPHIC DRY COPYING PROCESS
Helmut Kampfer, Cologne, Anita von Konig, Erwin Ranz, Harald von Rintelen, and Dietmar Mayer, Leverkusen, and Klaus Sasse, Cologne, Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany
No Drawing. Filed Apr. 28, 1970, Ser. No. 32,726
Claims priority, application Germany, May 24, 1969, P 19 26 655.8
Int. Cl. G03c *5/54, 1/52*
U.S. Cl. 96—29 **20 Claims**

Photographic prints can be produced by imagewise exposure of a light-sensitive layer containing a transferable image producing compound and a light-sensitive compound capable of reacting upon exposure with an image producing compound to yield a non-transferable reaction product. The exposed layer is heated and contacted with an image receiving layer containing compounds capable of reacting with the heat transferred image producing compound to form the image dye.

The light-sensitive compound is an organic azide compound and the image producing transferable compound a compound of the pyrazolidone-3-series.

3,674,481

IMAGE RECEIVING MATERIAL FOR THE SILVER SALT DIFFUSION PROCESS

Anita von Konig and Werner Liebe, Leverkusen, and Helmut Timmler, Wuppertal-Vohwinkel, Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed May 27, 1970, Ser. No. 41,085

Claims priority, application Germany, June 14, 1970, P 19 30 339.0

Int. Cl. G03c 5/54

U.S. Cl. 96—29 2 Claims

A light-insensitive image receiving material for the silver salt diffusion process comprising an image receiving layer which contains a compound of the mercapto triazole series.

3,674,482

NOVEL PHOTOGRAPHIC PRODUCTS AND PROCESSES

Richard J. Haberlin, Weston, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed July 13, 1970, Ser. No. 54,372

Int. Cl. G03c 5/54

U.S. Cl. 96—29 13 Claims

A composite film structure comprising a laminate including a common support carrying on one surface, in order, a layer containing silver precipitating nuclei, an inert non-nucleated polymeric layer and a layer containing photosensitive silver halide crystals. Subsequent to exposure and processing, the layer containing photosensitive silver halide crystals may be removed thereby providing a film unit wherein a protective layer is located over the layer in which the image is formed, i.e., the layer containing the silver precipitating nuclei. In a particularly preferred embodiment, an additive color screen is employed between the support and the layer containing silver precipitating nuclei. The disclosed film structure is particularly suitable for use as motion picture film.

3,674,483

REPRODUCTION METHOD

Marcel Nicolas Vrancken, Hove, Eric Maria Brinckman, Mortsel, and Frans Clement Heugebaert, Kontich, Belgium, assignors to Agfa-Gevaert, Mortsel, Belgium

No Drawing. Filed Apr. 24, 1969, Ser. No. 819,100

Claims priority, application Great Britain, June 17, 1968, 28,778/68

Int. Cl. G03f 7/02

U.S. Cl. 96—33 18 Claims

A method of recording information using a recording material having a water-permeable recording layer consisting essentially of a continuous phase of at least one proteinaceous hydrophilic colloid binder having distributed therethrough finely divided particles of a hydrophilic inorganic photoconductive compound in one embodiment and finely divided particles of a non-photoconductive hydrophilic pigment, plus an organic photoconductive dye, in another embodiment, wherein the recording layer is image-wise exposed to active electromagnetic radiation and then developed by contacting the same with an aqueous liquid to produce a visible change in the recording layer by penetration or removal of the water-permeable unexposed regions of the layer by the aqueous liquid. The ratio by weight of hydrophilic particles to hydrophilic colloid is about 1:1 to 5:1 and the proportion of the organic photoconductive dye is at least about 0.05% by weight of the hydrophilic non-photoconductive particles.

3,674,484

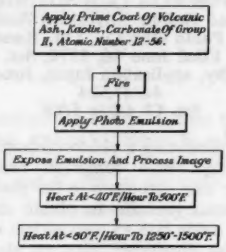
PHOTOGRAPHS ON CERAMIC OR CERAMIC-LIKE SURFACES

Victor Spinski, Newark, Del., assignor to University of Delaware

Filed Jan. 28, 1971, Ser. No. 110,506

Int. Cl. G03c 7/00

U.S. Cl. 96—34 8 Claims


Apply Prime Coat Of Volcanic Ash, Kaolin, Carbonate Of Group II, Atomic Number 12-56.
Fire
Apply Photo Emulsion
Expose Emulsion And Process Image
Heat At <50°F./Hour To 500°F
Heat At <80°F./Hour To 1250°-1500°F

Ceramic objects are conveniently decorated using photographic techniques by first preparing the surface of the object in any conventional manner, for example, by first firing the green object to bisque temperature, allowing the object to cool, washing it with an alkaline solvent, and drying it. To the prepared surface is then applied a priming coat which is generally a mixture of volcanic ash, kaolin, and a water-insoluble carbonate of a Group II element of atomic number 12 to 56 all uniformly dispersed in water. The priming coat is allowed to dry and the object is then fired to bisque temperature around cone 08. Upon cooling, a photographic emulsion containing an image forming component is applied to the coated object under conditions conventional to the photographic art. The object with the now photosensitive surface is then exposed by conventional photographic techniques and processed to develop the image. The entire object is thereafter placed in a furnace and heated at a rate not to exceed 40° F. per hour to 500° F., then at a rate not to exceed 80° F. per hour to from 1250° F. to 1500° F. and then allowed to cool slowly to ambient temperature. The object thus obtained has a glazed black and white silver image of lasting durability.

3,674,485

METHOD OF MANUFACTURING ELECTRICALLY CONDUCTING METAL LAYERS

Hendrik Jonker, Casper Johannes Gerardus Ferdinand Janssen, and Lambertus Postma, Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

No Drawing. Filed Sept. 18, 1968, Ser. No. 760,711

Claims priority, application Netherlands, Sept. 22, 1967, 6712933

Int. Cl. G03c 5/00

U.S. Cl. 96—35 8 Claims

Electrically conductive metal patterns are produced by exposing a homogeneous mixture of a hydrophobic resinous binding agent and a light-sensitive semiconductive oxide such as titanium dioxide to light, treating the exposed areas with a copper solution or a solution of a metal at least as high as copper in the E.M.F. series to form a metal nuclei image, and then intensifying the nuclei image by the use of a stabilized physical developer

or by the use of an electroless copper, cobalt or nickel-plating bath.

3,674,486
PHOTORESIST MATERIAL AND METHOD OF FORMING PRINTING PLATES AND RESULTING PRODUCT
Jack Milgrom, Concord, Mass., assignor to Arthur D. Little, Inc., Cambridge, Mass.
Filed Feb. 2, 1970, Ser. No. 7,603
Int. Cl. G03c *1/68*
U.S. Cl. 96—35.1 15 Claims

A photoresist material suitable for exposure through a process transparency to actinic light to produce a letterpress printing plate and a method of producing such a printing plate. Exposure may be accomplished while the plate is mounted on a cylinder to eliminate the need for possible distortion compensation.

3,674,487
MASK OVERLAY CHECKING MEANS
William O. Druschel, Granite Springs, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed June 18, 1970, Ser. No. 47,497
Int. Cl. G03c *5/04, 5/06*
U.S. Cl. 96—41 24 Claims

A method for comparing the pattern in a pair of light masks, e.g., masks having regions transparent to light and regions opaque to light. A light masking copy, either positive or negative, of each of the masks is made. The opaque region in one of said copies is rendered semitransparent, after which a light sensitive substrate is exposed through both of said copies superimposed in registration with each other to produce a three-tone composite image in the light sensitive substrate of the pair of masks in registration.

Where one of the masks has smaller regions which should be positioned within limits of larger regions on the other mask when said masks are used in registration with each other, the type of copy, either positive or negative, made of each mask as well as the selection of the mask in which the opaque regions are rendered semitransparent is governed by the requirement that said smaller regions in said copies are at least as opaque as said larger regions.

3,674,488
METHOD OF MAKING MATCHING PHOTOPRINTING MASTERS
John Alton Dodd, Jr., Haddonfield, and George Harry Line, Cherry Hill, N.J., assignors to RCA Corporation
Filed May 21, 1970, Ser. No. 39,477
Int. Cl. G03c *5/06;* G03f *5/00*
U.S. Cl. 96—44 9 Claims

Two matched photoprinting masters, one comprising an array of uniform opaque dots of a given size and the other comprising an array of opaque dots of a different size, on a transparent background, with exactly the same pattern, are made by first making an accurate original master, having an array of elemental areas, each containing the outlines of the two different size dots in the two desired matching masters, positioned in the desired pattern on a transparent background, and at least one intermediate original master comprising an array of opaque dots having a diameter intermediate the diameters of the two different size dots, arranged in a pattern closely matching the desired pattern on a transparent background. Then, these two masters are combined by photoprinting techniques, using the intermediate master to mask portions of the outlines of the accurate master, to produce the desired two matching small and large dot masters. These two matching masters may be used in the making of shadow masks for color picture tubes.

3,674,489
PHOTOGRAPHIC IMAGE AMPLIFYING WITH COPPER IONS
John E. Wyman, Lexington, Mass., assignor to Itek Corporation, Lexington, Mass.
No Drawing. Filed July 11, 1968, Ser. No. 743,981
Int. Cl. G03c *5/24*
U.S. Cl. 96—48 27 Claims

This disclosure relates to photographic amplifying systems comprised of a solution of copper ions and certain reducing agents which selectively deposit copper metal on latent metal photographic images to increase the density of the images. The amplifying systems are particularly effective with latent metal images of photographic media comprising a radiation activated photoconductor. Also described are processes for amplifying photographic images.

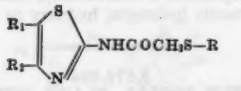
3,674,490
PROCESS FOR THE PRODUCTION OF PHOTOGRAPHIC IMAGES
Reinhart Matejec, Leverkusen, Germany, assignor to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany
No Drawing. Filed Dec. 2, 1969, Ser. No. 881,610
Claims priority, application Germany, Dec. 11, 1968, P 18 13 920.3
Int. Cl. G03c *5/24, 7/00, 1/00*
U.S. Cl. 96—48 R 14 Claims

Photographic images are produced by imagewise production of nuclei for the decomposition of peroxy compounds in the presence of reaction components for a color-forming oxidizing reaction.

The image dye consists at least in part of the dye obtained by the oxidizing reaction.

3,674,491
DEVELOPING PROCESS
Yoo Iijima, Isao Shimamura, Tokiharu Kondo, and Haruhike Iwano, Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Nov. 30, 1970, Ser. No. 93,672
Claims priority, application Japan, Nov. 29, 1969, 44/95,485
Int. Cl. G03c *5/30*
U.S. Cl. 96—66.3 16 Claims

A process for developing a silver halide photographic light-sensitive material which comprises developing the light-sensitive material in the presence of a compound represented by the following general formula:

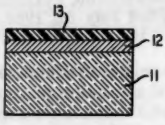


wherein R represents an unsubstituted or substituted alkyl group of 1–5 carbon atoms, aralkyl group of 1–5 carbon atoms, or aryl group, and R_1 and R_2 each represents a hydrogen atom or an alkyl group of 1–5 carbon atoms, said R_1 and R_2 also capable of forming an unsaturated condensed ring of 5–6 carbon atoms, which may be further substituted by an alkyl group of 1–5 carbon atoms.

3,674,492
LAMINAR PHOTOMASK
Michael Richard Goldrick, Maplewood, Robert Eugene Kerwin, Westfield, and John George Skinner, Basking Ridge, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Dec. 9, 1970, Ser. No. 96,452
Int. Cl. G03c *1/76*
U.S. Cl. 96—68 5 Claims

A high speed, high resolution laminar photomask is obtained by coating a transparent substrate member with

chromium or iron oxide, a photoresist and a thin film of a high resolution photographic emulsion having a thickness of the order of 2.0 micrometers. The resultant photo-



mask is found to enhance the speed of conventional photoresists and to increase the effective field of view of projection systems by reducing the required image modulation.

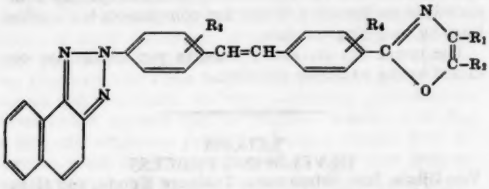
3,674,493

PHOTOGRAPHIC ELEMENTS CONTAINING FLUORESCENT BRIGHTENING AGENTS

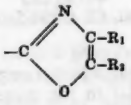
Roy A. Jeffreys and David A. Thomas, Hatch End, England, assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Apr. 3, 1970, Ser. No. 25,567
Int. Cl. G03c 1/92
U.S. Cl. 96—72 **15 Claims**

Photographic elements comprising a white reflecting support provided with a fluorescent brightening agent having the formula:



wherein R_1 and R_2 are selected from the group consisting of hydrogen, alkyl and aryl



collectively, represents a benzoxazolyl nucleus and R_3 and R_4 each represents hydrogen, hydroxy or acyloxy.

3,674,494

REFLECTIVE METAL PLATE WITH PHOTOPOLYMERIZABLE LAYER CONTAINING METAL COMPLEX DYE

Horst Hoffmann, Ludwigshafen, Carl Heinrich Krauch, Heidelberg, and Hans-Werner Otto and Otto Volkert, Ludwigshafen, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

No Drawing. Filed Jan. 27, 1970, Ser. No. 6,301
Claims priority, application Germany, Feb. 1, 1969, P 19 05 012.5
Int. Cl. G03c 1/68, 1/70
U.S. Cl. 96—86 P **6 Claims**

Improved relief plates, particularly printing plates, prepared by exposing under an image-bearing transparency a layer, which can be crosslinked by exposure and has been applied to a light-reflecting substrate of a substantially homogeneous mixture of solid polymers, monomers, photoinitiators and, if desired, polymerization inhibitors, which mixture also contains finely dispersed therein a soluble metal complex dye, and washing out the unexposed areas.

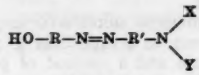
3,674,495

SENSITIZING LAYER

Teruo Esaka, Tokyo, Japan, assignor to Okamoto Chemical Industry Company Limited, Saitama Prefecture, Japan

No Drawing. Filed Sept. 5, 1969, Ser. No. 855,773
Claims priority, application Japan, May 30, 1969, 44/42,322
Int. Cl. G03c 5/18, 7/30
U.S. Cl. 96—91 R **10 Claims**

A sensitizing layer containing an ester of a compound of the general formula



(wherein R represents a benzene or naphthalene nucleus with a radical selected from the group consisting of hydroxyl, halogen, nitro, alkyl and alkoxy; R' represents a benzene nucleus which may contain a radical selected from the group consisting of hydroxyl (—OH), halogen (—Cl, F, Br, I), nitro (—NO_2), alkyl (—C_nH_{2n+1}) and alkoxy (—OC_nH_{2n+1}); and X and Y individually represent a radical of alkyl, alkylalcohol (—C_nH_{2n}·OH) or alkoxy) with a diazonaphtholsulfonic acid.

3,674,496

NEGATIVE LIGHT-SENSITIVE MATERIAL

Jury Sergeevich Bokov, K-482, korpus 338a, kv. 61; Ninel Vladimirovna Vikulina, K-482, korpus 505, kv. 57; Boris Aristarkhovich Dogadkin, Ulitsa Schukina 8/1, kv. 25; Boris Vasilievich Erofeev, Khlebny pereulok 9, kv. 26; Anastasia Vasilievna Larina, K-460, korpus 229, kv. 4; Vadim Petrovich Lavrischev, Ploschad Junosti 4, kv. 22; and Vladimir Vladimirovich Markov, Bolotnikovskaya ulitsa 42, korpus 3, kv. 88, all of Moscow, U.S.S.R.; Sofia Fadeevna Naumova, Tipografskaya ulitsa 3, kv. 69; and Olga Demidovna Jurina, Ulitsa V. Khoruzhaya 33, kv. 80, both of Minsk, U.S.S.R.; and Galina Dmitrievna Yarovaya, K-460, korpus 216, kv. 14, Moscow, U.S.S.R.

No Drawing. Filed Jan. 16, 1970, Ser. No. 3,481
Claims priority, application U.S.S.R., Apr. 11, 1968, 1,231,856
Int. Cl. G03c 1/52
U.S. Cl. 96—91 N **5 Claims**

A negative light-sensitive material comprising a polymer base which is polycyclohexadiene-1,3 or a copolymer of cyclohexadiene-1,3 with diene hydrocarbons, an organic solvent and a light-sensitive additive of the type of bisazides.

3,674,497

PHOTOGRAPHIC EMULSIONS CONTAINING NONPOLYMERIC AMINES

Ramsis Gobran, Roseville, and Ronald F. Ofstead, Maplewood, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

No Drawing. Continuation-in-part of application Ser. No. 542,448, Apr. 14, 1966. This application Oct. 7, 1970, Ser. No. 78,934
Int. Cl. G03c 1/02
U.S. Cl. 96—94 **8 Claims**

Improved, novel photographic emulsions comprising a photosensitive silver halide and a synthetic peptizing hydrophilic colloid therefor, containing incorporated therein about one to 200 mole percent based on silver present therein of the acidic salt of a nonpolymeric amine of the group consisting of alkylamines, aromatic amines, alkaryl amines, cycloalkyl amines, and heterocyclic amines or mixtures thereof, said amines having one to 18 carbon atoms for each amino nitrogen atom contained therein. Also provided is a process for making the novel emulsions. 1,8-menthane diamine, a preferred nonpolymeric amine, also forms a useful complex with silver halide.

3,674,498

METHOD FOR APPLYING METAL CONTACTS ONTO DIODE ARRAY

John R. Rushton, Temple, Pa., assignor to Bell Telephone Laboratories, Inc., Murray Hill, N.J.

Filed Dec. 22, 1969, Ser. No. 887,206
Int. Cl. G03c; G03b
U.S. Cl. 96—119 3 Claims

A process is disclosed for applying metal contacts over a diode type storage device. An X–Y array of square metal contacts is formed on the diode-containing surface. The diode array and the square array require no registration other than a preselected relative orientation.

3,674,499

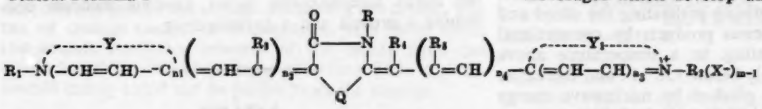
SILVER HALIDE PHOTOGRAPHIC SUPERSENSITIZED EMULSION

Keisuke Shiba, Masanao Hinata, Nobuo Tusji, Takushi Miyazaki, and Akira Sato, Kanagawa, Japan, assignors to Fuji Photo Film, Ltd., Nakanuma, Minami Ashigara Machi, Ashigara-Kamigun, Kanagawa, Japan

No Drawing. Filed May 27, 1970, Ser. No. 41,092
Claims priority, application Japan, May 27, 1969, 44/41,169
Int. Cl. G03 *1/10*
U.S. Cl. 96—123 27 Claims

A supersensitizing combination for use in a photographic emulsion comprising (1) a sensitizing dye having the general formula

General Formula I



wherein the symbols R, R_1, R_2, R_3, R_4, R_5, X, Y, Y_1, Q, n_1, n_2, n_3, n_4 and m are described hereinafter, and (2) a condensate of formalin with a halogenated polyhydroxy benzene or a halogenated cresol, is disclosed.

3,674,500

PROCESS OF PRODUCING A MEAT-LIKE TEXTURIZED FOOD PRODUCT

Taro Nagasawa, Mamoru Tomita, and Tomokazu Obayashi, Tokyo, Yoshitaka Tamura, Yokohama, and Yoko Kenmotsu, Odawara, Japan, assignors to Morinaga Milk Industry Co. Ltd.

Filed May 12, 1969, Ser. No. 823,783
Claims priority, application Japan, Dec. 23, 1968, 43/93,762
Int. Cl. A23j *1/14, 3/00*
U.S. Cl. 99—17 24 Claims

A foodstuff material having a meat-like texture is prepared by mixing a protein solution with a solution containing free divalent cations in the concentration of more than 0.06 mole so that the ratio is more than 0.25 millimole of the free divalent cations per 1 g. of the protein, reacting them in a highly alkaline region of pH 9 or higher at a temperature of above 40° C. to produce a coagulated protein and, after neutralizing the excess of alkali, filtering the coagulated protein, and washing with water and dehydrating it.

3,674,501

PREPARATION OF SOYBEAN DERIVATIVES USEFUL AS EGG WHITE EXTENDERS AND WHIPPING AGENTS

Norman L. Betz, Creve Coeur, and Nickolas J. Stepaniuk, Florissant, Mo. (both of 3600 N. 2nd St., St. Louis, Mo. 63160)

Filed Jan. 29, 1970, Ser. No. 6,792
Int. Cl. A23j *1/14*
U.S. Cl. 99—17 6 Claims

Substantially oil-free soybean grits are first extracted with an acid-water solution having a pH of 4–6 and containing a trace of proteolytic enzyme, the purpose of the latter being to remove or deactivate the enzyme inhibitor naturally present in soybeans. After separating the aqueous extract from the residual grits, preferably by continuous centrifugal separation, the former may be concentrated and purified by ultrafiltration and then spray-dried to recover a soya derivative that is a useful egg white extender. The extracted grits are subjected to enzymatic hydrolysis under conventional conditions, but the hydrolysis proceeds much more rapidly because of the previous enzyme treatment. The resulting aqueous hydrolysis solution is advantageously separated from the spent grits, then concentrated and purified as before. Improved soya-derived whipping agents are thereby obtained. Combining the acid-water and hydrolysis extracts yields an even broader range of novel soya-derivatives useful as egg white extenders and whipping agents.

3,674,502

NONRINGING BEVERAGES CONTAINING POLY(OXYETHYLENE) - POLY(OXYPROPYLENE) - POLY(OXYETHYLENE) COPOLYMERS

Raymond Honey, Mount Kisco, N.Y., and James Frank Perkins, Ramsey, N.J., assignors to Firmenich Incorporated, New York, N.Y.

No Drawing. Filed Sept. 5, 1969, Ser. No. 855,782
Int. Cl. A23l *1/26*
U.S. Cl. 99—28 5 Claims

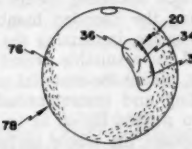
Beverages which develop undesirable surface layers or rings during storage due to being flavored with normally difficultly dispersible flavor oils, such as citrus oils, mint oils and extracts of roots and herbs, are rendered clear and nonringing by use of poly(oxyethylene)-poly(oxypropylene)-poly(oxyethylene) copolymers therein.

3,674,503

PEELING CITRUS FRUIT

Lyle J. Martinsen, Murray, Utah, assignor to Practical Innovations, Inc., Murray, Utah

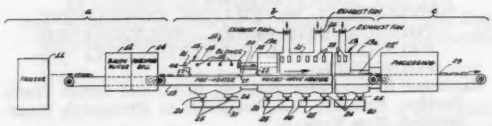
Filed Feb. 9, 1970, Ser. No. 9,804
Int. Cl. A23l *1/00*
U.S. Cl. 99—100 8 Claims



Peelers for cutting and peeling citrus fruit and the like and related methods. Each peeler is formed in one piece and has a holding flange adapted to be gripped between the fingers of the user, a cutting portion having a cutting edge, and a depth gauge flange which regulates the depth of the cut made by the cutting edge. The holding flange and the depth gauge flange are joined to one another by a weakened or structurally less resistant bend line so that in one position the two flanges are linearly continuous with the cutting edge being closely juxtaposed the opposed flanges whereby the user of the citrus fruit is not advertently cut, and in another position the two flanges are angular with respect to each other, the cutting edge being situated in an exposed cutting position. Each peeler may be conveniently releasably attached, as by bonding, to the citrus fruit so that the peeler and citrus fruit may be conveniently

shipped, stored or carried by a person. The configuration of each peeler is adapted to match the exterior configuration of the fruit so as to be flush therewith when attached thereto.

3,674,504
PROCESS FOR COOKING BACON AND OTHER MEAT PRODUCTS USING INFRA-RED AND MICROWAVE ENERGY
Alan B. Lane, Northridge, Calif., assignor to Hunt-Wesson Foods, Inc., Fullerton, Calif.
Continuation of application Ser. No. 737,074, June 14, 1968, which is a continuation-in-part of application Ser. No. 646,008, June 14, 1967. This application June 5, 1970, Ser. No. 41,778
Int. Cl. A22c *18/00*
U.S. Cl. 99—107 5 Claims



A process for cooking cold or refrigerated bacon and other meat products comprising preheating the sliced and shingled bacon or other meat products by conventional means, e.g. infra-red heating, to a temperature above about 50° F. and preferably below 150° F. and thereafter further heating the meat product by microwave energy until it is properly precooked to a desired degree.

3,674,505
PROCESS FOR MANUFACTURING INSTANT HAMBURGER STEAK
Yuichi Shinkawa, 21–8, 3-chome, Tsukishima, Chuo-ku, Tokyo, Japan
No Drawing. Continuation-in-part of application Ser. No. 687,483, Dec. 4, 1967. This application Jan. 11, 1971, Ser. No. 105,624
Int. Cl. A22c *18/00*
U.S. Cl. 99—108 3 Claims

A process for manufacturing an instant hamburger steak which comprises kneading meats and vegetables with starch, flavoring the kneaded hamburger material with seasoning and spices, immersing the flavored material in hot edible oil for a suitable period to effectuate a preliminary cooking, taking the material out of the edible oil to permit cooling and instantaneously dipping the cooled material into molten fat so as to form a film of fat in solid state around the whole surface of the hamburger steak. Alternatively, the preliminary cooking can be effected by steaming, or by steaming followed by immersion in hot cooking oil.

3,674,506
FORMING A FILLED EDIBLE CASING
Eugene D. Schilling and Phyllis I. Burchill, Minnneapolis, Minn., assignors to General Mills, Inc.
No Drawing. Filed Mar. 18, 1970, Ser. No. 20,799
Int. Cl. A22c *11/00, 13/00*
U.S. Cl. 99—109 16 Claims

Preparation of filled edible casing by extruding edible plastic mass of non-heat coagulable simple protein and water in the form of a casing and introducing an edible flowable material into the casing as said casing is being formed.

3,674,507
VOLUME-INFLATED FREEZABLE PRODUCT PRESERVABLE IN THE FRESH STATE AND A PROCESS FOR MANUFACTURING SAME
Daniel Carasso, Paris, France, assignor to Societe Anonyme dite: Compagnie Gervais-Danone, Courbevoie, France
Filed Oct. 24, 1969, Ser. No. 869,185
Int. Cl. A23g *5/00*
U.S. Cl. 99—136 11 Claims

A milk based insufflated product having a volume increase factor of 1.4 to 2.0 and containing milk, cream, sugar, coloring matter and essences in combination with a 0.1–1% of a stabilizer against syneresis, about 0.2–1% of a stabilizer for insuring an insufflated structure and about 0.2–3% of at least one starchy substance.

3,674,508
PRODUCTION OF CHEESE FLAVOR
Robert L. Kasik, Oak Lawn, and Anthony J. Luksas, Chicago, Ill., assignors to Beatrice Foods Co., Chicago, Ill.
No Drawing. Filed May 13, 1969, Ser. No. 824,250
Int. Cl. A23c *19/02, 19/12;* A23l *1/26*
U.S. Cl. 99—140 R 34 Claims

A basic cheese flavor or a cheddar cheese flavor is produced in a short time by growing a combination of one member of the genus Bacillus and one member of the genus Streptococcus in an aqueous medium containing a protein and a carbohydrate.

3,674,509
PROTEIN CROSS-LINKED WITH PHOSPHONITRILIC HALIDE
Robert E. Miller, Ballwin, Mo., assignor to Monsanto Company, St. Louis, Mo.
No Drawing. Filed Oct. 27, 1970, Ser. No. 84,479
Int. Cl. A23j *3/00;* A23k *1/18*
U.S. Cl. 99—2 N 8 Claims

Improved protein feed material for ruminants which is resistant to digestive breakdown in the rumen but not in the abomasum and/or intestines which comprises the reaction product of a protein-containing feed material and a phosphonitrilic halide. Exemplary of such phosphonitrilic halides is phosphonitrilic chloride trimer.

3,674,510
METHOD AND COMPOSITION FOR PREVENTING DECAY OF FRUIT AND INHIBITING SPORULATION THEREON
John R. Bice and Philip J. Lewis, Corona, Calif., assignors to Brogdex Company, Pomona, Calif.
No Drawing. Filed July 10, 1970, Ser. No. 53,996
Int. Cl. A23b *7/14*
U.S. Cl. 99—154 6 Claims

A method for simultaneously controlling molds and fungi, which cause decay of fruit, and inhibiting sporulation of said molds and fungi on said fruit, by directly contacting the surface of such fruits with 2-(4-thiazolyl) benzimidazole and an alkali metal salt of ortho-phenyl phenol tetrahydrate, the amount of 2-(4-thiazolyl)benzimidazole applied to said fruit being sufficient to leave a residue on the surface of said fruit of 1 to 2 parts per million, by weight based on the weight of the fruit, and the amount of the alkali metal salt of ortho-phenyl phenol tetrahydrate applied to said fruit being sufficient to leave a residue on the surface of said fruit of from 5 parts per million to 10 parts per million, by weight expressed as ortho-phenyl phenol, based on the weight of the fruit.

3,674,511
TREATMENT OF SAUSAGE CASING FOR EASY PEELING

Henry J. Rose, Albin F. Turbak, and Thomas E. Leahy, Jr., Danville, Ill., assignors to Tee-Pak, Inc., Chicago, Ill.

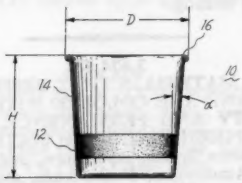
No Drawing. Filed Sept. 22, 1969, Ser. No. 860,087
Int. Cl. A22c *13/00*
U.S. Cl. 99—176 6 Claims

Sausages, such as frankfurters and bolognas, formed in synthetic casings are more easily peeled by soaking the casings, either prior to or after stuffing with a sausage emulsion, with a soluble non-toxic food grade salt, complex, or coordination compound of iron, aluminum, calcium or magnesium which will interact with components of the sausage emulsion to modify the surface characteristics of the sausage. The soluble metal compound in some cases may be applied to casings, e.g. frankfurter casings, at the time of manufacture just prior to drying the casing. The soluble metal compounds however may be applied more generally to all types of casings either just prior to or at some point after the stuffing of the casing with sausage emulsion. In the case of larger casings of the type used for bolognas the soluble metal compounds may be applied to the soak water. These soluble metal compounds may also be applied as an external soak bath for the stuffed sausages, both of the frankfurter and bologna types, or in the shower applied to soak the casings prior to peeling, to saturate the casing and provide a uniform application of the metal compound to interact with the sausage emulsion components at the surface contacting the casing. The use of casings soaked or impregnated with these metal compounds facilitates removal of the casing from the smoked and/or cooked sausages at a time when the untreated casing could not be peeled from the sausage.

3,674,512
PLASTIC CONTAINERS

Arthur A. Andros, Brussels, Belgium, assignor to Monsanto Europe S.A., Brussels, Belgium

Filed Nov. 21, 1969, Ser. No. 878,791
Claims priority, application Great Britain, Nov. 22, 1968, 55,539/68
Int. Cl. B65d *85/76, 1/26*
U.S. Cl. 99—178 5 Claims



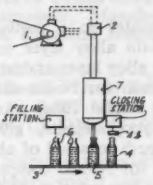
A plastic container the inside of which has an area of roughness so that when the container is filled with yogurt or other similarly viscous product, the tendency of the product to separate into its components or more independently of the container wall is lessened.

3,674,513
METHOD FOR PACKING CARBONATED BEVERAGES INTO CONTAINERS USING ELECTROMAGNETIC ENERGY

Nils Ake Elsner, Hagersten, and Hans Erik Nilson, Stockholm, Sweden, assignors to Infrarodteknik AB, Vanersborg, Sweden

Filed Dec. 18, 1969, Ser. No. 886,106
Claims priority, application Sweden, Dec. 20, 1968, 17,558/68
Int. Cl. B65b *55/16*
U.S. Cl. 99—217 1 Claim

A method for packing carbonated beverages into containers is disclosed. A container is almost but not completely filled through an inlet opening thereof with a carbonated beverage, an unfilled space remaining between the level of the beverage and the inlet opening. Infrared electromagnetic waves or microwaves are directed through the inlet opening into the beverage, thereby liberating the

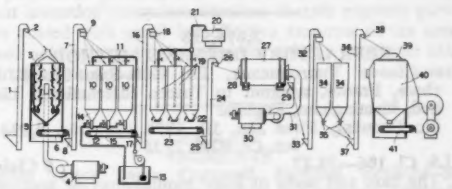


carbon dioxide in the carbonated beverage so that the carbon dioxide forms gas bubbles which form a layer of foam above the level of the liquid, filling the empty space in the container and expelling residual air from this empty space. Immediately thereafter the inlet opening is fluid-tightly sealed.

3,674,514
SYSTEM FOR PREPARING PARBOILED ROUGH RICE

Toshihiko Satake, 2–38 Nishihon-machi, Saijo-cho, Kamo-gun, Hiroshima-ken, Japan

Filed Aug. 28, 1970, Ser. No. 67,935
Int. Cl. A23b *9/00*
U.S. Cl. 99—237 R 7 Claims



A system for preparing parboiled rough rice, in which apparatus is provided for providing brown rice enwrapped in chaffs with cracks, in advance of subjecting it to moistening, steaming and drying steps, whereby the time required for properly moistening the rough rice is remarkably shortened and parboiled rough rice thus prepared become enriched because of nutritious substances which are penetrated inwardly into endosperm thereof by means of water absorbed thereinto through the cracks.

3,674,515
METALIZING COMPOSITION INCLUDING DEGASSED PLATINUM POWDERS

Denis G. Kelemen, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Original application Mar. 27, 1968, Ser. No. 716,357, now Patent No. 3,511,640, dated May 12, 1970. Divided and this application Jan. 30, 1970, Ser. No. 7,230
Int. Cl. H01b *1/02;* C09d *5/24*
U.S. Cl. 106—1 3 Claims

A process of preparing degassed platinum powders comprising mixing finely divided platinum powder with at least an equal volume of a diluent metal oxide powder, heating the powder mixture for a sufficient time to dissipate substantially all gases from the platinum powder, cooling the powder mixture and separating the platinum powder from the diluent. The degassed platinum powders are particularly suitable for application to "green" ceramic sheets employed in the production of monolithic multilayer ceramic circuit components.

3,674,516
ELECTROLESS CODEPOSITION OF NICKEL ALLOYS
Zlata Kovac, 5 Bayard Road, Apt. 913, Pittsburgh, Pa. 15213
No Drawing. Filed Nov. 27, 1970, Ser. No. 93,444
Int. Cl. C23c *3/02*
U.S. Cl. 106—1 14 Claims

The invention relates to a method for electrolessly depositing a nickel-tin alloy layer and for depositing a nickel-molybdenum alloy layer and to baths therefor. The electroless plating bath for Ni-Sn comprises an aqueous solution containing nickel ions, stannate ions, sodium tartrate, sodium hypophosphite, glycine and sufficient KOH to bring the bath to a pH of about 13.5. The electroless plating bath for Ni-Mo comprises an aqueous solution containing Ni ions, glycine, sodium hypophosphite, molybdate ions, and KOH to bring the pH to about 13.5.

3,674,517
SOLUTION FOR DEPOSITING TRANSPARENT METAL FILMS
Richard G. Miller, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.
No Drawing. Continuation-in-part of application Ser. No. 829,755, June 2, 1969. This application July 23, 1970, Ser. No. 57,754
Int. Cl. C23c *3/02*
U.S. Cl. 106—1 10 Claims

An aqueous chemical filming composition that deposits a transparent coating having a metallic luster at a rate which is relatively rapid and then relatively slower; and which effectively ceases to produce coating while the coating remains transparent is disclosed.

3,674,518
REFRACTORY DRESSING METHOD
Jean-Claude Vuaroqueaux, La Celle-Saint-Cloud-Jonchere, France, assignor to Toseco International Limited, Birmingham, England
No Drawing. Filed Jan. 19, 1970, Ser. No. 4,094
Int. Cl. B28b *7/38*
U.S. Cl. 106—38.27 5 Claims

The base and walls of ingot moulds may be protected against molten metal erosion in use by applying a refractory dressing of a magnesium aluminate, e.g. a crushed aluminous slag, together with an inorganic binding agent therefor, in a liquid medium.

3,674,519
METHOD OF MANUFACTURING PORCELAIN FOR ELECTRIC INSULATORS BY CONTROLLING GRAIN SIZE
Noboru Higuchi and Yutaka Ogawa, Nagoya, and Akihiro Watanabe, Hiashima, Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan
Filed Aug. 29, 1969, Ser. No. 855,465
Claims priority, application Japan, Nov. 21, 1968, 43/84,820
Int. Cl. C04b *33/26*
U.S. Cl. 106—46 10 Claims

The toughness of porcelain materials, or the crack-propagation-resistance thereof, can be improved by using quartz or calcined bauxite with a controlled grain size distribution. A method for producing porcelains with improved toughness, by firing at a temperature of 1,180° C. to 1,350° C., a body containing less than 30.0% by weight of quartz having a grain size distribution consisting of less than 2.0% by weight of particles with an effective diameter smaller than 10 microns and more than 97.0% by weight of particles with an effective diameter smaller than 50 microns, or a body containing 10.0 to 60.0% by weight of calcined bauxite grains having a grain size distribution consisting of less than on the order of about 3% by weight of particles with an effective diameter smaller than 1 micron and less than 60.0% by weight of particles with an effective diameter smaller than 10 microns and more than 97.0% by weight of particles with an effective diameter smaller than 60 microns.

3,674,520
SOLDER GLASS FOR ADHERING, SEALING OR COATING
Yoshiro Suzuki and Shigehiro Nagahara, Tokyo, and Nobuyoshi Ichimura, Yokohama, Japan, assignors to Asahi Glass Company Limited, Tokyo, Japan
No Drawing. Filed Sept. 17, 1970, Ser. No. 73,212
Claims priority, application Japan, Sept. 27, 1969, 44/76,701
Int. Cl. C03c *3/04, 3/08, 5/00*
U.S. Cl. 106—54 1 Claim

A solder glass suitable for adhering, sealing and coating a shaped refractory or semiconductor device, which contains by weight, ZnO 60–68%; B_2O_3 20–30%, SiO_2 8–11%, and SnO_2 0.1–3.0%; and which preferably further contains one or more of PbO 0–6%, Sb_2O_3 0–0.8%, As_2O_3 0–0.5%, CeO_2 0–1.5%, Ta_2O_5 0–1.0%, and/or Nb_2O_5 0–1.0%.

The solder glass of this invention is characterized by a remarkably low coefficient of thermal expansion and which is capable of protecting a semiconductor device.

3,674,521
CLAY
Frank Raymond Noble, Cornwall, England, assignor to English Clays Lovering Pochin & Company Limited, Cornwall, England
No Drawing. Filed May 5, 1970, Ser. No. 34,881
Claims priority, application Great Britain, May 12, 1969, 24,165/69
Int. Cl. C04b *33/12*
U.S. Cl. 106—72 15 Claims

The invention concerns a method of treating a raw kaolinitic clay in order to improve the rheological properties thereof. The raw kaolinitic clay is saturated or substantially saturated with cations selected from the group consisting of lithium ions, magnesium ions and sodium ions, and is then heated to a temperature in the range of from 200° C. to 450° C. The clay is washed with an aqueous washing medium after it has been saturated or substantially saturated with said cations and either before or after said heating.

3,674,522
MASONRY MATERIALS THAT RESIST EFFLORESCENCE AND ARE COLORED WITH INCREASED INTENSITY AND PERMANENCE, AND METHODS OF PRODUCING SUCH MATERIALS
Johannes Petrus Brants, Apeldoorn, and Johan van der Meulen, Amsterdam, Netherlands, assignors to Akzo N.V., Arnhem, Netherlands
No Drawing. Filed Feb. 22, 1971, Ser. No. 117,695
Claims priority, application Netherlands, Feb. 25, 1970, 7002633, 7002634
Int. Cl. C04b *7/56*
U.S. Cl. 106—90 25 Claims

Efflorescence of masonry structures composed of cold-hardened masonry materials, such as, concrete, sand-lime bricks, asbestos cement and cement plasterwork, or of stone or fired bricks, is suppressed by the condensation product of at least one alkylene polyamine and/or polyalkylene polyamine, and epichlorhydrin. The condensation product in the form of an aqueous or more volatile solution thereof may be applied to the surfaces of the masonry structure or, in the case of such structures composed of cold-hardened materials, is preferably incorporated in such material prior to the hardening or setting thereof. The condensation product is further found to increase the coloring power and permanence of pigments when added with the latter to cold-hardening materials prior to the hardening or setting thereof.

3,674,523
OIL MODIFIED CELLULOSIC SAUSAGE CASINGS
Henry J. Rose and Albin F. Turbak, Danville, Ill., assignors to Tee-Pak, Inc., Chicago, Ill.
No Drawing. Continuation-in-part of applications Ser. No. 431,181, Feb. 8, 1965, and Ser. No. 763,942, Sept. 30, 1968, now Patent No. 3,607,328. This application Dec. 30, 1970, Ser. No. 102,986
Int. Cl. C08b *21/20*
U.S. Cl. 106—168 4 Claims

Tubular regenerated cellulose films suitable for use as sausage casings are prepared by incorporating a single vegetable or animal fatty oil or mineral oil in viscose and extruding the resulting mixture into conventional coagulation and regeneration and wash baths. The oil is added in an amount ranging from about 0.1–12% based on the weight of cellulose and is emulsified into the viscose to produce oil droplets in the cellulosic casing having individual particle sizes less than 0.1 mm. in diameter. Cellulosic sausage casings having an oil content and particle size in the range specified are soft and flexible and may be shirred at moisture contents ranging from about 5% to about 20% without the necessity of adding additional moisture to the shirred product, or using shirring lubricant during shirring.

3,674,524
WOOD COATING COMPOSITION COMPRISING CHOLESTEROL, GLYCERIDE OIL OR SQUALENE AND A LIQUID FATTY ACID
Gertrude S. Littlepage, 3410 38th St., Washington, D.C. 20016
No Drawing. Filed July 22, 1970, Ser. No. 57,346
Int. Cl. C08h *9/00*
U.S. Cl. 106—243 11 Claims

Compositions which consist essentially of cholestrol or an oil selected from a glyceride oil squalene in a normally fatty acid such as oleic acid as a solvent are found to provide novel wood processing and finishing formulations. The compositions are characterized by extraordinarily deep wood-penetrating power and an ability to endow wood with unusual protective properties. Other advantages of the compositions reside in their ability to (1) restore usual sheen, add desired sheen and enhance or improve color, (2) bring out the natural beauty and true color of wood, (3) remove spots and conceal marks or scratches.

3,674,525
PLASTICIZED SULFUR COMPOSITIONS
Rector P. Louthan, Bartlesville, Okla., assignor to Phillips Petroleum Company
No Drawing. Filed Feb. 25, 1970, Ser. No. 14,195
Int. Cl. C07g; C08h; C09k
U.S. Cl. 106—287 SC 6 Claims

The viscosity of plasticized sulfur compositions comprising elemental sulfur plasticized with an organic sulfur-plasticizing agent is reduced by the addition of a modifying amount of an unsaturated acid or unsaturated acid anhydride to the plasticizing agent prior to its use for plasticizing sulfur.

3,674,526
MOLDABLE METAL POWDER COMPOSITIONS
James M. Self, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
No Drawing. Continuation-in-part of application Ser. No. 739,627, June 25, 1968. This application Mar. 10, 1970, Ser. No. 18,345
Int. Cl. C08h *17/24*
U.S. Cl. 106—286 9 Claims

This invention is generally directed toward compositions of metal powder aggregate or mixtures of a metal powder aggregate and a refractory, and a siliceous binder which when formed and cured are useful as strong, heat conductive shapes, e.g. tooling compounds; and cured articles of the above composition.

3,674,527
PIGMENT COMPOSITIONS
Alfons Anzelm Komander, Manchester, England, assignor to Imperial Chemical Industries Limited, London, England
No Drawing. Filed Jan. 9, 1970, Ser. No. 1,849
Claims priority, application Great Britain, Jan. 14, 1969, 2,097/69
Int. Cl. C08h *17/66*
U.S. Cl. 106—289 8 Claims

Manufacture of pigment compositions by simultaneously precipitating heavy metal lake of a water soluble acid dye heavy metal salt of a rosin, at pH 7–8 in presence of a non-ionic surface active agent which has a cloud point at or below the temperature at which the precipitation is carried out.

3,674,528
TITANIUM DIOXIDE PIGMENT COMPOSITIONS OF MATTER USEFUL IN PRINTING INK COMPOSITIONS
George E. Bronson, Englishtown, N.J., assignor to NL Industries, Inc.
No Drawing. Filed Oct. 22, 1970, Ser. No. 83,166
Int. Cl. C09c *1/36*
U.S. Cl. 106—300 2 Claims

The present invention relates to a titanium dioxide pigment composition having improved properties when used in polyamide printing inks. The composition of the instant invention comprises titanium dioxide pigment particles coated with small but effective amounts of the nonanoic acid salt of triethanolamine and the propionic acid salt of triethanolamine.

3,674,529
PIGMENTS
Gerald Lance Toms, Cornwall, England, assignor to English Clays Lovering Pochin & Company Limited, Cornwall, England
Filed Sept. 8, 1970, Ser. No. 70,114
Claims priority, application Great Britain, Sept. 9, 1969, 44,561/69
Int. Cl. C09c *1/02, 1/28*
U.S. Cl. 106—306 14 Claims

A method of preparing a mixed pigment which comprises blending together (a) an aqueous suspension of a deflocculated calcium carbonate pigment, and (b) an aqueous suspension of a flocculated clay pigment, and dewatering the blended aqueous suspensions to obtain a cake of the desired mixed pigment.

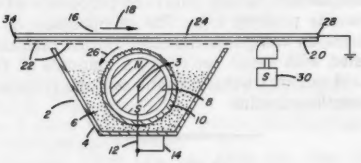
3,674,530
OPTICAL GLASSES HAVING IMPROVED SPECTRAL TRANSMISSION PRODUCED FROM MERCURY NITRATE CONTAINING GLASS BATCHES
Emil W. Deeg, Woodstock, Conn., and Robert E. Graf, Southbridge, Mass., assignors to American Optical Corporation, Southbridge, Mass.
Continuation of abandoned application Ser. No. 848,216, Aug. 7, 1969. This application Mar. 18, 1971, Ser. No. 125,885
Int. Cl. C03c *3/00*
U.S. Cl. 106—47 Q 5 Claims

The invention relates to a series of new glasses of the low crown and low flint type but with refractive indices lower than those previously obtainable and with improved spectral transmission. The crux of the invention provides for the controlled inclusion of an effective amount of mercury nitrate in glass batch compositions.

3,674,531
SYNTHETIC POLYESTER FILM ASSEMBLIES
Basil Robert Shephard, Margaret Loudon Clachan, and David Rankine Kennedy, Manningtree, Essex, and Terence Arnold Abbott, Norwich, England, assignors to Bexford Limited, Manningtree, England
No Drawing. Continuation of abandoned application Ser. No. 809,377, Mar. 21, 1969. This application June 1, 1971, Ser. No. 148,974
Claims priority, application Great Britain, Mar. 25, 1968, 14,283/68
Int. Cl. G03c *1/80*
U.S. Cl. 117—7 25 Claims

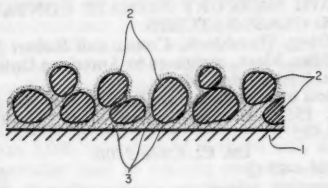
A film assembly suitable for use as a base for photographic film comprises synthetic linear polyester film base carrying a layer of a copolymer of a vinyl halogeno ester such as vinyl chloroacetate with at least one other monomer copolymerisable therewith, the said monomer and at least one of said monomers being selected so that the final copolymer has a softening point lower than that of the product obtained by polymerisation in the absence of the said selected monomer or monomers.

3,674,532
CONTROL FOR BIAS OF MAGNETIC BRUSH AND METHOD
Theodore H. Morse, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed July 23, 1970, Ser. No. 57,653
Int. Cl. G03g *13/08, 15/08*
U.S. Cl. 117—17.5 6 Claims



Improved development of electrostatic charge patterns is achieved by the use of the development control device disclosed which electrically biases a magnetic brush during development to a voltage initially sensed by the brush.

3,674,533
METHOD OF MAKING A MATERIAL FOR FORMING A WALL SURFACE
Mitio Matsubara, Marugame, Shigeyuki Yagyu, Oazahiga, and Satoru Takeuchi, Marugame, Japan, assignors to Shikoku Kasei Kogyo Company Limited, Marugame, Japan
Filed May 21, 1970, Ser. No. 39,242
Int. Cl. B28b *19/00;* E04f *21/02*
U.S. Cl. 117—27 4 Claims



Material for forming a wall surface with an embossed appearance and a method for making the same. The material comprises aggregate particles, colored clay, short fibers, and a water-soluble adhesive. The short fibers hold the aggregate particles to the wall surface. The material can be plastered on the wall surface by spraying or by trowelling.

3,674,534
PREPARATION OF TWO-SIDE COATED PHOTOSENSITIVE PAPERS
Michael John Cannair, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
No Drawing. Filed Nov. 30, 1970, Ser. No. 93,891
Int. Cl. B44d *1/02, 1/14*
U.S. Cl. 117—34 5 Claims

Photosensitive papers such as proofing paper, imageable on both sides, are produced by (a) first coating one side with a composition comprising a volatile organic solvent and a film-forming polymeric binder, and photosensitive ingredients, followed by drying to evaporate the solvent at a controlled rate, thereby forming a film, then (b) sequentially coating the second side with the composition in two or more coating and drying stages. Careful control of the multi-stage coating conditions, drying steps, volatile organic solvents, polymeric binders, photosensitive composition, and paper substrates yield blister-free, two-side coated, photosensitive papers.

3,674,535
HEAT-SENSITIVE RECORD MATERIAL
James H. Blose, Dayton, and Shashikant G. Talvalkar, Xenia, Ohio, assignors to The National Cash Register Company, Dayton, Ohio
No Drawing. Filed July 15, 1970, Ser. No. 55,233
Int. Cl. B41m *5/18*
U.S. Cl. 117—36.8 2 Claims

A heat sensitive record material which comprises (1) a base sheet such as paper, and (2) a coating of a colorless chromogenic material and a bisphenol distributed in a polyvinyl alcohol in combination with a filler such as clay, a lubricant such as zinc stearate and a nontacky wax. Conventional wetting agents and defoamers also are present in the record material. This material is resistant to pick-off of the record sheet surface and freeze-sticking of the record sheet to the printing head when the record material is used in conjunction with a rapidly heated and cooled printing head.

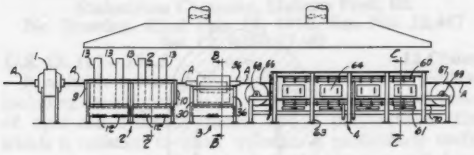
3,674,536
METALLIZED POLYOLEFIN COMPOSITIONS CONTAINING COUMARONE-INDENE RESINS AND METHOD OF PREPARING
Habet M. Khelghatian and Wassily Poppe, Springfield, Pa., assignors to Arisum Corporation, Philadelphia, Pa.
No Drawing. Filed Jan. 6, 1969, Ser. No. 789,423
Int. Cl. B44d *1/092;* C23c *3/02*
U.S. Cl. 117—47 A 7 Claims

Solid, substantially crystalline polyolefin compositions are provided from blends of a polyolefin and from about 1% to about 55% by weight of a compatible thermoplastic adhesion-promoting coumarone-indene resin modifier. The modified compositions may be metallized by conventional electroplating or other metallizing processes to form metallized shaped articles.

3,674,537
PROCESS FOR COATING WIRE
Rudolph S. Bratko, 10712 Harvard Ave., Cleveland, Ohio 44105
Filed Oct. 30, 1969, Ser. No. 872,501
Int. Cl. B44d *5/10*
U.S. Cl. 117—49 9 Claims

The disclosure herein is of a method and apparatus for applying a coating to wire or the like in a continuous

manner, which coating acts as both a lubricant and protective covering for the wire, to facilitate either storage of the wire or subsequent drawing operations to be performed thereon. The term "wire" is intended to note various diameters of the material and also shapes of cross section thereof, and includes rod or the like where it is desired to apply a coating thereto.



The coating is effected by preliminarily cleaning the wire as by shotblasting or the like, subsequently raising the temperature of the wire by a preheating operation, thereafter applying the coating whether the same be calcium hydroxide, borax or the like, and subsequently drying the coating, all of the foregoing being effected while the wire or rod or material is moving so that a continuous coating operation is performed and the usual coiling and recoiling may be obviated.

3,674,538
HEAT-SENSITIVE SHEET
Takashi Suzuki, Ikeda-shi, Japan, assignor to Matsushita Electric Industrial Co. Ltd., Osaka, Japan
No Drawing. Continuation-in-part of application Ser. No. 514,800, Dec. 20, 1965. This application Apr. 8, 1969, Ser. No. 814,433
Int. Cl. B41m *5/26*
U.S. Cl. 117—36.7 **6 Claims**

A heat-sensitive sheet using a mixture of p-cresyl phosphate and other organic phosphoric acid esters such as triphenyl phosphate, tributyl phosphate, 2 - ethylhexyl phosphate and mixtures of tricresyl phosphate isomers.

3,674,539
METHOD FOR PROCESSING CELLULOSIC FIBRE MATERIAL
Andre Parisot, Saint-Cloud, and Daniel Meimoun, Rueil-Malmaison, France, assignors to Institut Textile de France, Boulogne-sur-Seine, France
No Drawing. Filed Aug. 12, 1969, Ser. No. 849,490
Claims priority, application France, Aug. 14, 1968, 163,110
Int. Cl. B44d *1/092*
U.S. Cl. 117—56 **16 Claims**

Textile articles composed partially or totally of cellulose fibres are improved by

(a) swelling the fibres by means of an aqueous solution of a compound which interrupts hydrogen bonding such as an organic or inorganic base the concentration of such solution being such as to limit the swelling to a determined level;

(b) replacing the aqueous swelling solution within the swollen fibre progressively by a series of liquids, the first of which is miscible in all proportions with water such as an alcohol, acetone, dioxan, and the like, and the last of which is miscible in all proportions with that which precedes it such as an aromatic hydrocarbon, and without variation of the initial state of swelling;

(c) including into the fibre a relatively elastic substance which has an initial modulus of elasticity lower than of cellulose such as isoprene, butadiene, and the like.

3,674,540
METHOD OF MAKING A FILTER FOR TOBACCO SMOKE
Stavros Pergaminos, 5 Pythias St., Athens (809), Greece
Filed Aug. 26, 1969, Ser. No. 853,087
Int. Cl. A24c *5/50*
U.S. Cl. 117—56 **9 Claims**

A highly porous filter for tobacco smoke made up of a demineralized, defatted, gas-fluffed and bleached woven cotton fabric gauze impregnated with a mixture of water soluble chlorophyll, tannic acid and glycerine.

The bleached fabric is defatted by dipping in an aqueous caustic soda solution followed by rinsing and drying. Defatting increases the porosity and surface area of the fabric, of the threads thereof and of the fibers themselves, thereby increasing the amount of the chlorophyll-tannic acid-glycerine mixture which can be subsequently absorbed and/or adsorbed by the fabric and increasing the capacity of the fabric to retain, and thereby remove from the tobacco smoke, the toxic materials in such smoke. The defatted fabric is demineralized by dipping in an aqueous hydrochloric acid solution. Demineralizing further increases the porosity and surface area of the fabric, the threads and the fibers, thereby further increasing the amount of the aforesaid mixture which can be absorbed and/or adsorbed by the fabric and the capacity of the fabric to remove the toxic materials in the tobacco smoke. The defatted, demineralized fabric is gas-fluffed by dipping the fabric, while it still contains hydrochloric acid from the demineralizing step, into a solution of sodium bicarbonate to neutralize the hydrochloric acid and generate in the interstices of the fabric and threads CO_2 gas which thins or spreads or disperses and thereby fluffs the fabric and threads to further increase the surface area and porosity thereof, followed by drying.

The mixture of chlorophyll, tannic acid and glycerine is applied to the defatted, demineralized and gas-fluffed fabric by dipping in a solution of such mixture in water and ethyl alcohol followed by drying.

The treated fabric is loosely packed within a confined volume to provide a highly efficient filter, which is effective to remove as high as 85% of the tars present in cigarette or cigar smoke without deleteriously affecting draw. The filter may take the form of a cigarette or cigar filter which may be manufactured and sold as part of the cigarette or cigar or it may be packed in a capsule for insertion in a cigarette or cigar holder or it may be packed directly in a dispensable cigarette or cigar holder.

3,674,541
ALUMINUM PLATING PROCESS
Eiichi Ichiki, Kazuo Iida, Yasuhiko Inoue, and Yoshihiro Kondo, Niihama, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan
No Drawing. Filed Oct. 26, 1970, Ser. No. 84,188
Claims priority, application Japan, Oct. 29, 1969, 44/87,115; Oct. 31, 1969, 44/87,740
Int. Cl. B44d *1/44, 1/48;* C23c *11/00*
U.S. Cl. 117—62 **18 Claims**

Aluminum plating according to which aluminum film formed has no cracks and pin-holes, a uniform thickness and excellent surface luster can be attained by contacting a substrate covered with aluminum with a small amount of a surface treating agent selected from active hydrogen-containing compounds, oxygen and halogens and thereafter taking out thus treated substrate into the air.

3,674,542

GLASS FIBERS SIZED WITH A COMPOSITION COMPRISING A VINYLIC AROMATIC-DIOLEFIN COPOLYMER AND A HYDROLYZABLE SILANE

Byron M. Vanderbilt, Westfield, N.J., and James J. Fasnacht, Shaler Township, Allegheny County, Pa.; said Vanderbilt assignor to Esso Research and Engineering Company, and said Fasnacht assignor to PPG Industries, Inc.

Original application Sept. 8, 1965, Ser. No. 485,857, now Patent No. 3,484,223, dated Dec. 16, 1969. Divided and this application June 17, 1969, Ser. No. 854,001
Int. Cl. C03c 25/02
U.S. Cl. 117—72 31 Claims

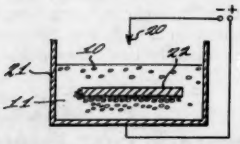
The disclosed invention relates to a method of coating glass fibers with a carrier medium having 1–10% of solid, non-blocking, unsaturated copolymer of a vinyl aromatic, a C_4 to C_8 diolefin in which at least 50% of the unsaturation is of the 1,2 or 3,4 type, the average molecular weight being about 1,000 to 30,000, additionally the carrier contains 0.2 to 2% of a hydrolyzable silane.

3,674,543

ELECTRODEPOSITION

Masamichi Sato, 105 Ohaza, Mizonuma, Asaka-shi, Saitama, Japan

Filed Aug. 18, 1970, Ser. No. 64,687
Claims priority, application Japan, Aug. 18, 1969, 44/64,832
Int. Cl. B01k 5/02
U.S. Cl. 117—93 7 Claims



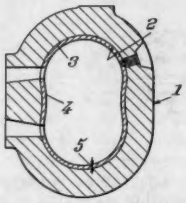
A method of electrodepositing a coating onto a substrate from a bath of coating particles suspended in an electrically insulating liquid by immersing the substrate either wholly or partially into the bath. A pair of electrodes are provided on either side of the substrate but insulated from it. One electrode may contact the bath, for instance it may lie inside the container or be the container. The other electrode is supported outside of the bath. A potential is applied to the electrodes sufficient to cause a corona discharge through the bath whereby the particles are electrophoretically moved to and deposited on the substrate.

3,674,544

METHODS OF COATING SURFACES AND IN ELEMENTS COMPRISING SUCH SURFACES

Albert Grosseau, Chaville, France, assignor to Societe Anonyme Automobiles Citroen, Paris, France

Filed Dec. 24, 1969, Ser. No. 887,828
Claims priority, application France, Dec. 31, 1968, 182,896
Int. Cl. B05b 5/00, 7/08, 7/14
U.S. Cl. 117—93.1 PF 9 Claims



The inner surface of a light alloy crank-case envelope of a rotary piston engine is coated by spraying a wear-resistant layer thereon. Carbon steel and nickel aluminide are sprayed on simultaneously by at least two oxy-acetylene flame or plasma flame guns. Spherical grain particles such as SiC, TiB or BC can be incorporated.

3,674,545

RADIATION CURABLE EPOXY COATING COMPOSITION AND METHOD OF COATING

Clifford Hugh Strolle, Springfield, Pa., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Apr. 7, 1970, Ser. No. 26,436
Int. Cl. B44d 1/50; C08f 1/16
U.S. Cl. 117—93.31 9 Claims

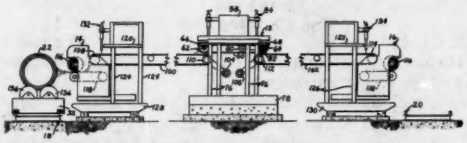
A radiation curable coating composition comprised of an epoxy ester syrup, Epon phosphate syrup, silicone-wax dispersion and a polyfunctional unsaturated monomer.

3,674,546

METHOD FOR COATING PIPE

Robert J. Harris, Marrero, and Irvin J. Lee, Gretna, La., assignors to H. C. Price Co., Bartlesville, Okla.

Filed Jan. 6, 1971, Ser. No. 104,428
Int. Cl. B44d 1/02, 1/08
U.S. Cl. 117—94 7 Claims



A method and apparatus for coating a pair of pipe sections utilizes spaced, parallel, track vehicles for moving the sections on opposite sides of a central coating station. Coating material is alternately supplied from the station to two applicators, which are located adjacent and perpendicular to the respective tracks, by a reversible feeder belt. Movement of the sections is forward to the coating station and then backward away from the station. The pipe sections are spaced apart in their directions of travel so that their paths are 180° out of phase and one of the sections is at the forward end of its path of travel while

the other is at the backward end of its path of travel. Thus, one section can be subjected to the coating step while the other section is being removed from the track vehicle.

3,674,547

COMPOSITE MATERIAL AND PROCESS FOR PREPARING SAME

Thomas M. Noone, Oak Park, Ill., assignor to The Richardson Company, Melrose Park, Ill.

No Drawing. Filed Feb. 18, 1970, Ser. No. 12,467
Int. Cl. B32b 27/40
U.S. Cl. 117—135.5 12 Claims

Breathable synthetic composites for articles of clothing including shoe uppers are provided by laminates composed of open-cell synthetic foams and a polyurethane film which is resistant to water transfer. A particularly useful composite comprises a polyvinylchloride open-cell foam and a thermoplastic polyurethane film containing a plasticizer such as tri-butoxyethyl phosphate to improve moisture-vapor transmission properties of the composite.

3,674,548

PROCESS FOR IMPARTING SOIL-RELEASING AND ANTI SOIL-REDEPOSITION PROPERTIES TO TEXTILE MATERIALS

Dmitry M. Gagarine, Spartanburg, S.C., assignor to Deering Milliken Research Corporation, Spartanburg, S.C.

No Drawing. Filed Apr. 9, 1969, Ser. No. 814,843
Int. Cl. C08j 1/44
U.S. Cl. 117—139.5 A 7 Claims

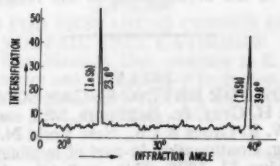
A process is disclosed for imparting improved durable soil-releasing and anti-soil-redeposition properties to textile materials containing natural fibers. The process comprises applying to said material, a textile resin, a pigment and a hydrophobic film-forming polymer binder, and curing said textile resin on said textile material. The textile materials treated in this manner exhibit improved soil-releasing and anti-soil-redeposition characteristics upon repeated cleanings in either aqueous detergent solutions or dry cleaning solvents.

3,674,549

MANUFACTURING PROCESS FOR AN InSb THIN FILM SEMICONDUCTOR ELEMENT

Masahide Ohshita, Kanagawa, and Tsunehiro Tsukagoshi, Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Feb. 25, 1969, Ser. No. 802,079
Claims priority, application Japan, Feb. 28, 1968, 43/12,276; May 23, 1968, 43/34,316
Int. Cl. H01l 3/20, 7/32
U.S. Cl. 117—201 2 Claims



A process for producing a thin film semiconductor element of InSb having electron mobility and Hall coefficient values similar to bulk InSb is provided, wherein InSb and Sb are evaporated simultaneously from separate sources in a high vacuum to deposit a film, wherein InSb and Sb are evaporated simultaneously upon conjugating InSb and Sb on a single common vapor source in a high vacuum, or wherein InSb, produced by the zone melting method with a ratio of In to Sb of 1.5 to 2 in weight, is evaporated.

3,674,550

METHOD OF ELECTROLESS DEPOSITION OF A SUBSTRATE AND SENSITIZING SOLUTION THEREFOR

Glenn O. Mallory, Inglewood, Calif., assignor to Allied Research Products, Inc., Baltimore, Md.

No Drawing. Filed Mar. 4, 1970, Ser. No. 16,548
Int. Cl. C23c 3/02
U.S. Cl. 117—212 11 Claims

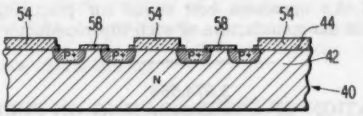
Prior to electrolessly depositing a metal on a substrate, the substrate is treated with an aqueous solution of a complex of a metal of the platinum family and thereafter with an aqueous solution of a reducing agent for the platinum family metal. The complex can be a nitrito salt of the platinum metal or a salt of the metal with a keto-carboxylic acid or diglycollic acid.

3,674,551

FORMATION OF OPENINGS IN INSULATING LAYERS IN MOS SEMICONDUCTOR DEVICES

Terry George Athanas, Lebanon, N.J., assignor to RCA Corporation

Filed Oct. 12, 1970, Ser. No. 79,982
Int. Cl. C23f 1/02
U.S. Cl. 117—212 9 Claims



Small openings in insulating coatings on MOS semiconductor devices are defined by (1) forming, on the surface of a semiconductor wafer at the desired locations for the openings, masking bodies of a material which is soluble in a given solvent; (2) depositing over the entire wafer a coating of a material which is not soluble in that solvent; (3) etching this coating in a suitable solvent to expose the masking bodies formed in step (1) and portions of the surface of the wafer; (4) oxidizing the exposed portions of the surface of the wafer; and, finally (5) removing the masking bodies in the given solvent.

3,674,552

METHOD OF PRODUCING SEMICONDUCTOR COMPONENTS ON A MAGNETIC SUBSTRATE

Walter Heywang and Erhard Sirtl, Munich, Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

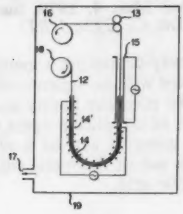
Filed Feb. 10, 1967, Ser. No. 615,110
Claims priority, application Germany, Feb. 11, 1966, S 101,950
Int. Cl. B44d 1/18
U.S. Cl. 117—217 23 Claims

Relates to a method of epitactic precipitation of monocrystalline semiconducting material, crystallizing according to the diamond lattice or the zincblende lattice, using a monocrystalline substrate, which crystallizes according to the spinel type. The substrate has magnetic characteristics.

3,674,553
SUPERCONDUCTOR AND ITS MANUFACTURING METHOD

Kyoji Tachikawa, Yoshiaki Tanaka, and Satoshi Fukuda, Tokyo, Japan, assignors to Director of National Research Institute for Metals, Tokyo, Japan

Original application June 19, 1967, Ser. No. 646,820. Divided and this application June 1, 1970, Ser. No. 54,049
Claims priority, application Japan, June 25, 1966, 41/41,040
Int. Cl. B44d *1/18*
U.S. Cl. 117—217 5 Claims

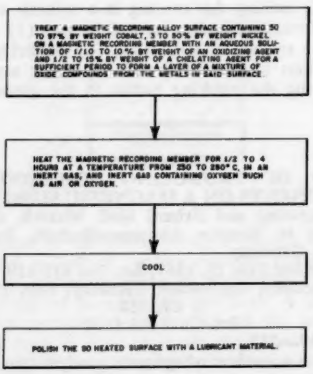


A superconductor consisting of a vanadium substrate of wire or tape form and an overlying layer of superconductive V_3Ga intermetallic compound. A method for manufacturing such superconductor, comprising the steps of forming a layer of intermediate compounds richer in gallium on the surface of a vanadium substrate having said form through a reaction between the vanadium substrate and the surrounding molten gallium at a temperature between 500° C. and 800° C., and of converting said phase to V_3Ga at a temperature between 600° C. and 850° C. An apparatus best suited for practicing said method in the manufacture of such superconductor.

3,674,554
FORMATION OF OXIDE COATING ON SURFACE OF A MAGNETIC COBALT NICKEL ALLOY

Pravin K. Patel and Eliot Stone, Los Angeles, Calif., assignors to The National Cash Register Company, Dayton, Ohio

Filed July 23, 1970, Ser. No. 57,671
Int. Cl. H01f *10/00*
U.S. Cl. 117—237 9 Claims


TREAT A MAGNETIC RECORDING ALLOY SURFACE CONTAINING 50 TO 97% BY WEIGHT COBALT, 3 TO 50% BY WEIGHT NICKEL ON A MAGNETIC RECORDING MEMBER WITH AN AQUEOUS SOLUTION OF 1/10 TO 10 % BY WEIGHT OF AN OXIDIZING AGENT AND 1/2 TO 15% BY WEIGHT OF A CHELATING AGENT FOR A SUFFICIENT PERIOD TO FORM A LAYER OF A MIXTURE OF OXIDE COMPOUNDS FROM THE METALS IN SAID SURFACE.
HEAT THE MAGNETIC RECORDING MEMBER FOR 1/2 TO 4 HOURS AT A TEMPERATURE FROM 250 TO 350° C. IN AN INERT GAS, AND INERT GAS CONTAINING OXYGEN SUCH AS AIR OR OXYGEN.
COOL
POLISH THE SO HEATED SURFACE WITH A LUBRICANT MATERIAL.

A protective oxide film may be located on the surface of a cobalt nickel magnetic alloy by treating the surface of such an alloy with an aqueous solution of an inorganic oxidizing agent and an organic chelating agent capable of buffering the solution so as to oxidize the surface. Such treatment is preferably carried on for sufficiently long periods to form an adherent, substantially continuous oxide layer from metal in the alloy. The concentration of the ingredients in the treatment solution can be varied depending upon the specific ingredients used, the reactivity of the particular alloy being treated, the temperature of the treatment solution and the thickness of the oxide film desired. After such treatment the alloy surface is preferably washed so as to remove entrained ingredients and then is preferably heated at a temperature of from 230 to 280° C. for a period of from one-half to four hours in either an inert atmosphere, an oxygen atmosphere or an atmosphere containing oxygen and one or more inert or substantially inert gases.

3,674,555
LOW DENSITY STARCH HYDROLYSATES

Gilbert R. Meyer, Overland Park, Kans., and Rollo J. Everett, Worth, Ill., assignors to CPC International Inc.

No Drawing. Filed June 24, 1970, Ser. No. 49,583
Int. Cl. A23l *1/26;* C13l *1/08*
U.S. Cl. 127—29 8 Claims

Process for producing spray dried starch hydrolysates having a bulk density below about 20 pounds per cubic foot which comprises: (a) heating an aqueous slurry containing from about 20% to about 45% by weight of a starch hydrolysate having a D.E. of from about 2 to about 30 in a first, confined zone under pressure of a temperature of from about 210° F. to about 300° F.; (b) injecting the slurry into a second, large volume zone into contact with heated air having a temperature of from about 320° F. to about 450° F. with a sudden release of the pressure on the slurry upon injection; (c) maintaining conditions in the second zone such that drying to a moisture content below about 3% is achieved before the resultant dry solids engage against a collection surface; and (d) recovering the dried solids in particulate form.

3,674,556
METHOD FOR DRYING GLUCOSE SOLUTIONS

Roland H. Gray, Jr., Baltimore, Md., assignor to W. R. Grace & Co., New York, N.Y.

No Drawing. Filed May 3, 1971, Ser. No. 139,960
Int. Cl. C13k *1/10*
U.S. Cl. 127—62 8 Claims

In a process for preparing dried, solid, glucose-containing products from glucose-containing solutions by drying droplets of the solution in a current of heated air and in the presence of separately introduced recycled dried product solids, the improvement which comprises maintaining the inlet temperature of the heated air in the range of from 400° to 500° Fahrenheit and the average air residence time in the drying zone in the range of 2 to 60 seconds.

3,674,557
METHOD FOR DRYING SUGAR SOLUTIONS

Roland H. Gray, Jr., Baltimore, Md., assignor to W. R. Grace & Co., New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 36,738, May 13, 1970. This application May 3, 1971, Ser. No. 139,961
Int. Cl. C13f *1/02*
U.S. Cl. 127—62 11 Claims

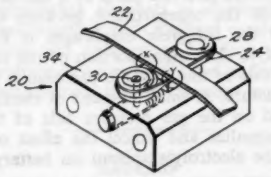
In a process for preparing dried, solid, sucrose-containing products from sucrose-containing solutions by drying droplets of the said solution in a current of heated air and in the presence of separately introduced recycled dried

product solids, the improvement comprising maintaining the inlet temperature of the heated air in the range of from 400° to 500° Fahrenheit and the average air residence time in the drying zone in the range of 2 to 60 seconds.

3,674,558
BLEACHING OF CLAYS
Peter James Malden, Cornwall, England, assignor to English Clays Lovering Pochin & Company Limited, Cornwall, England
No Drawing. Filed May 7, 1970, Ser. No. 35,592
Claims priority, application Great Britain, May 16, 1969, 25,216/69
Int. Cl. B03b 7/00; B08b 5/00; C09c 1/42
U.S. Cl. 134—2 10 Claims

A method of bleaching a clay which comprises contacting a dry, or substantially dry, particulate mass of the clay with a gas comprising ozone.

3,674,559
METHOD OF CLEANING MAGNETIC TAPE
Dale C. Whysong, Falls Church, Dale E. Leininger, Fairfax, and Herbert D. Young, Haymarket, Va., assignors to General Kinetics Incorporated, Reston, Va.
Filed Jan. 28, 1971, Ser. No. 110,574
Int. Cl. B08b 7/00
U.S. Cl. 134—9 2 Claims



A method and apparatus for cleaning magnetic tape wherein a continuous loop of material having a cutting edge is rotated while a flat surface of the tape is moved past and in contact with the cutting edge at two locations so that the surface is cleaned. In the embodiment set forth below, the loop is inclined at one location at an acute angle to the path of travel of the tape in one direction and at an acute angle in the other direction at the other location so that passage of the tape hones the cutting edge. The loop is preferably rotated about two capstans and one capstan can be moved toward the other at the same time that the guide members which define slots at the two locations separate for loading the loop.

3,674,560
PROCESS FOR PREPARING COPPER SULFIDE VOLTAIC CELL CATHODES
Hanspeter Alder, Newark, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
No Drawing. Filed Apr. 8, 1970, Ser. No. 26,761
Int. Cl. H01m 35/02
U.S. Cl. 136—23 10 Claims

Copper sulfide cathodes having improved discharge characteristics and increased electrochemical utilization of copper sulfide can be prepared by reducing, in a copper sulfide having a chemically bound sulfur to copper ratio of at least 0.94:1, to less than 2% the portion of the copper sulfide substance that is extractable by hot 0.5 N. aqueous hydrochloric acid. Highly efficient voltaic cells can be produced using this cathode structure.

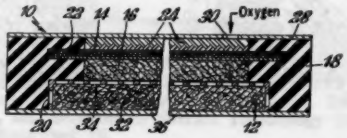
3,674,561
PROCESS FOR PRODUCING ELECTRODES FOR RECHARGEABLE ALKALINE CELLS
Takashi Tsuchida, Yoshiaki Hayase, and Yoshirou Fujisawa, Shizuoka-ken, Japan, assignors to Fuji Denki Kagaku Kabushiki Kaisha, Tokyo, Japan
Filed July 17, 1970, Ser. No. 55,631
Claims priority, application Japan, July 30, 1969, 44/59,652
Int. Cl. H01m 43/04
U.S. Cl. 136—29 14 Claims

Electrodes for rechargeable alkaline cells and a process for producing same are provided. The electrode comprises a substratum, metallic nickel dendrite electrolytically cohered on said substratum, and nickel oxy-hydroxide exposed on said nickel dendrite. The process comprises the steps of preparing an electro-bath containing NO_3 ion in the range of about 0.16% to about 3.52%, SO_4 ion in the range of about 1.4% to about 18.1%, and Cl ion in the range of about 2.2% to about 11.5%, keeping said electro-bath weakly acidic, keeping the temperature of said electro-bath over 40° C., electrolytically cohering nickel dendrite layers to a substratum, and immediately electrolytically oxidizing said layers in an alkaline aqueous solution.

3,674,562
PRIMARY CELLS AND IODINE CONTAINING CATHODES THEREFOR
Alan A. Schneider, Baltimore, Md., and James R. Moser, Shrewsbury, Pa., assignors to Catalyst Research Corporation, Baltimore, Md.
Filed Jan. 15, 1971, Ser. No. 106,657
Int. Cl. H01m 21/00
U.S. Cl. 136—83 R 12 Claims

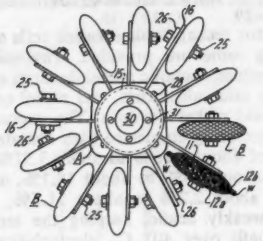
A mixture of iodine with a poly-2-vinylpyridine·I_2 or a poly-2-vinylquinoline·I_2 charge transfer complex is an improved cathode material of a plastic state and in conjunction with a metal anode, for example lithium, provides primary cells with improved capacity and performance characteristics.

3,674,563
OXYGEN-DEPOLARIZED GALVANIC CELL
Roswell J. Bennett, Lakewood, Ohio, assignor to Union Carbide Corporation, New York, N.Y.
Filed Apr. 6, 1970, Ser. No. 25,867
Int. Cl. H01m 29/04
U.S. Cl. 136—86 A 17 Claims



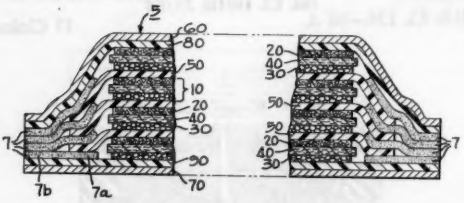
Disclosed is a high performance oxygen-depolarized galvanic cell which is capable of supplying electric power at extremely high electrode current densities. The cell basically includes a porous, electrolyte absorbent, extended area anode made from an electrochemically active metal, a thin, porous fixed zone oxygen-depolarizable cathode and a porous ionically permeable separator interposed between the anode and cathode and containing an alkaline electrolyte, the alkaline electrolyte being an aqueous solution of potassium hydroxide having a concentration of between about 10 and 14 normal.

3,674,564
SEA WATER BATTERY WITH FIBER-LIKE METAL CATHODE
Albert E. Ketler, Jr., 318 N. 6th St., Indiana, Pa. 15701
Filed Aug. 24, 1970, Ser. No. 66,422
Int. Cl. H01m *17/02*
U.S. Cl. 136—100 R 19 Claims



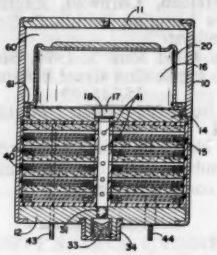
A galvanic battery or cell is disclosed for use in a salt water environment that constitutes the electrolyte for generation of electrical energy between cathode and anode electrodes of electro-reactive dissimilar metals, such as nickel, iron or steel and magnesium. The cathode is constructed of relatively coarse fiberlike metal such as steel wool or shavings, iron or steel scrap compactly-positioned as a core that is held in place by a perforated metal or grid enclosure of relatively flat or winglike shape. A group of such cathode electrode bodies is positioned in a spaced-apart relation with respect to each other and, as an optimum, in an endwise spaced relationship with respect to a solid metal anode electrode, such as of magnesium. Anode electrode means is shown having a portion of its metal surface area masked or covered by an insulating resin that may be progressively unmasked or exposed during the operating life of the battery.

3,674,565
MULTICELL BATTERY HAVING DOUBLE ADHESIVE, LIQUID SEALING WINDOW
Bernard C. Bergum, Monona, and Kenneth H. Kenyon, Madison, Wis., assignors to ESB Incorporated
Filed Dec. 21, 1970, Ser. No. 99,984
Int. Cl. H01m *21/00*
U.S. Cl. 136—111 9 Claims



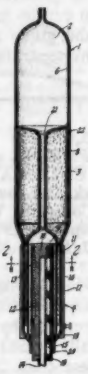
Around each cell of a multicell battery is a window, both sides of which are adhesive. The inside perimeter of each window, which overlaps a portion of the intercell connector between two adjacent cells, provides a first seal around a cell to prevent liquid from one cell from migrating either to another cell or to the exterior of the battery. The outside perimeter of each window extends beyond the edges of the intercell connector to provide a second seal which also prevents liquids from migrating from the interior to the exterior of the battery. The windows may be electrical insulators which serve the additional function of keeping electrically conductive intercell connectors and/or liquid impervious layers from coming into electrical contact with each other.

3,674,566
RESERVE BATTERY HAVING THE ELECTROLYTE COMPARTMENT MOVED BY GAS PRESSURE
Gerald P. Powers, North Wales, Pa., assignor to Honeywell Inc., Minneapolis, Minn.
Filed Nov. 19, 1970, Ser. No. 90,950
Int. Cl. H01m *21/00*
U.S. Cl. 136—114 10 Claims



An improved activator mechanism for a reserve electrochemical battery. The battery is comprised of an electrolyte compartment and a battery compartment separated from the electrolyte compartment by a frangible diaphragm. To activate the battery, the diaphragm, separating the two compartments, is perforated, allowing electrolyte liquid to flow from the electrolyte compartment into the battery compartment. The electrolyte compartment is divided into two parts by a movable partition. The portion of the compartment between the movable partition and the frangible diaphragm is filled with a liquid electrolyte. The other portion of the compartment on the other side of the movable partition is filled with a gas under pressure. A small amount of electrolyte liquid is also placed on the gas pressure side of the movable partition to equalize and cancel the effect of the vapor pressure of the electrolyte solvent on battery activation.

3,674,567
ELECTROLYSIS CELL AND PROCESS USING A WICK ELECTRODE
Thompson G. Bradley and Dominicus A. J. Swinkels, Indianapolis, Ind., assignors to General Motors Corporation, Detroit, Mich.
Original application Oct. 27, 1966, Ser. No. 590,038. Divided and this application Jan. 30, 1970, Ser. No. 871,120
Int. Cl. H01m *33/00*; C22d *3/06, 3/02*
U.S. Cl. 136—164 4 Claims



A combined electrode and liquid reactant transporting means for at least one liquid reactant of an electrolysis

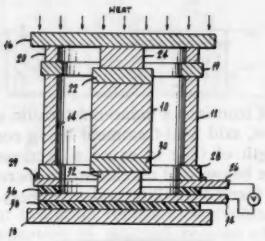
cell. A wick extends from within the cell into a liquid reactant collection reservoir. The wick is preferentially wet by the liquid reactant providing a plurality of capillary flow paths between the storage and cell regions of the system. An electrolysis process using the wick electrode is described.

3,674,568

HYBRID THERMOELECTRIC GENERATOR

Leroy J. Caprarola, Morristown, N.J., assignor to RCA Corporation

Filed Apr. 1, 1968, Ser. No. 717,526
Int. Cl. H01v *1/02*
U.S. Cl. 136—205 4 Claims



A cylindrical thermoelectric generator having two concentric thermoelectric elements is disclosed. The outer element is used together with the heat receiving and heat rejecting means and appropriate bonding and stress alleviation members, to hermetically seal under compression the inner element from the environment surrounding the generator.

3,674,569

METHOD OF MAKING A COMPOSITE CABLE SHEATHING HAVING AN ALUMINUM-SILICON LAYER

Michael J. Pryor, Woodbridge, and William H. Anthony, Guilford, Conn., assignors to Olin Mathieson Chemical Corporation

Application Sept. 11, 1968, Ser. No. 759,117, which is a continuation-in-part of application Ser. No. 677,955, Oct. 25, 1967, now Patent No. 3,579,313. Divided and this application Aug. 28, 1970, Ser. No. 67,978
Int. Cl. C22f *1/04;* B23p *11/00*
U.S. Cl. 148—11.5 A 6 Claims

This invention relates to a high strength aluminum alloy containing Zn, B, Mg and Si metallurgically bonded to a thin layer of an aluminum alloy containing at least .050% Si, which thin layer is also bonded to steel for use in both aerial and underground cable sheathing.

3,674,570

HIGH-STRENGTH LOW ALLOY FERRITIC STEEL SMALL-GAUGE WIRE

Ingemar Gustaf Terje Hallstrom, Martin Holger Jarleborg, and Stig-Goran Harry Tarnblom, Fagersta, Sweden, assignors to Fagersta Bruks AB, Fagersta, Sweden

No Drawing. Filed Jan. 21, 1971, Ser. No. 108,592
Claims priority, application Sweden, Feb. 11, 1970, 1,272/70
Int. Cl. C21d *9/52*
U.S. Cl. 148—12 9 Claims

The process for producing high-strength ferritic steel small-gauge wire having a diameter up to 1 millimeter comprising reducing the diameter of a killed low alloy steel rolled starting wire, said steel containing between about 0.01 and 0.06 carbon, between about 0.05 and 1% silicon, between about 0.25 and 6% manganese, between about 0.01 and 0.30% niobium, up to 0.03% nitrogen, up to 0.2% aluminum, up to 0.5% zirconium, up to 0.30% vanadium, and up to 0.5% titanium, by sequential passes through drawing dies constituting a drawing cycle, followed by tempering at a temperature between about 400° C. and 670° C., and further reduction with at least one additional drawing cycle, with tempering at a temperature between about 400° C. and 670° C. between each said drawing cycle, until the product wire dimension is obtained. The invention also includes the tough high-strength killed low alloy ferritic steel wire produced by said process.

3,674,571

NITRIDED ZIRCONIUM ALLOYS

Ray J. Van Thyne, Oak Lawn, and John J. Rausch, Antioch, Ill., assignors to Surface Technology Corporation, Stone Park, Ill.

No Drawing. Filed Mar. 4, 1970, Ser. No. 16,593
The portion of the term of the patent subsequent to Dec. 22, 1987, has been disclaimed
Int. Cl. C22c *27/00;* C23c *11/14*
U.S. Cl. 148—31.5 7 Claims

A novel group of nitrided alloys having excellent wear and abrasion resistance containing (a) zirconium, (b) one or more metals of the group vanadium, columbium, or tantalum, and (c) molybdenum or tungsten. The alloys can be readily fabricated to shape and then hardened by nitriding to produce high surface hardness.

3,674,572

NITRIDED TANTALUM, COLUMBIUM AND VANADIUM-RICH ALLOYS

Ray J. Van Thyne, Oak Lawn, and John J. Rausch, Antioch, Ill., assignors to Surface Technology Corporation, Stone Park, Ill.

No Drawing. Filed Mar. 4, 1970, Ser. No. 16,596
The portion of the term of the patent subsequent to Dec. 22, 1987, has been disclaimed
Int. Cl. C22c *27/00;* C23c *11/14*
U.S. Cl. 148—31.5 2 Claims

A novel group of nitrided alloys having excellent wear and abrasion resistance containing (a) one or more metals of the group tantalum, columbium, and vanadium, (b) one or more metals of the group titanium and zirconium, and (c) one or more metals of the group molybdenum or tungsten. The alloys can be readily fabricated to shape and then hardened by nitriding to produce a continuous high hardness surface layer supported on a graded nitrided layer.

3,674,573

NITRIDED SURFACE TREATED ALLOYS

Ray J. Van Thyne, Oak Lawn, and John J. Rausch, Antioch, Ill., assignors to Surface Technology Corporation, Stone Park, Ill.

No Drawing. Continuation-in-part of application Ser. No. 755,662, July 27, 1968, now Patent No. 3,549,429. This application Mar. 4, 1970, Ser. No. 16,594
Int. Cl. C22c *27/00;* C23c *11/14*
U.S. Cl. 148—31.5 1 Claim

Graded nitrided articles, surface modified in alloy composition wherein the surface zone consists of nitrided alloys consisting essentially of (a) one or more metals of the group columbium, tantalum, and vanadium; (b) zirconium and zirconium-titanium mixtures, and (c) one or both metals of the group molybdenum and tungsten. A minor portion of the nitrogen may be replaced by oxygen or boron. Nitrided materials prepared from homogeneous alloys are also included. The materials are characterized by excellent wear and abrasion resistance.

3,674,574
NITRIDED SURFACE MODIFIED ALLOYS

Ray J. Van Thyne, Oak Lawn, and John J. Rausch, Antioch, Ill., assignors to Surface Technology Corporation, Stone Park, Ill.

No Drawing. Continuation-in-part of application Ser. No. 755,658, Aug. 27, 1968, now Patent No. 3,549,427. This application Mar. 4, 1970, Ser. No. 16,595
Int. Cl. C22c *27/00;* C23c *11/14*
U.S. Cl. 148—31.5 2 Claims

Graded nitrided articles, surface modified in alloy composition wherein the surface zone consists of nitrided alloys consisting essentially of (A) one or more metals of the group columbium, tantalum, and vanadium; (B) titanium; and (C) one or both metals of the group molybdenum and tungsten. A minor portion of the nitrogen may be replaced by oxygen or boron. Nitrided materials prepared from homogeneous alloys are also included. The materials are characterized by excellent wear and abrasion resistance.

3,674,575
TUNGSTEN CARBIDE DISPERSION IN AGE-HARDENABLE CUPRO-NICKEL

Arnold L. Prill, Edmond, Okla., and Stuart E. Tarkan, Munsey, N.Y., assignors to Chromalloy American Corporation, West Nyack, N.Y.

Filed Oct. 21, 1970, Ser. No. 82,769
Int. Cl. C22c *29/00, 31/04*
U.S. Cl. 148—32.5 14 Claims

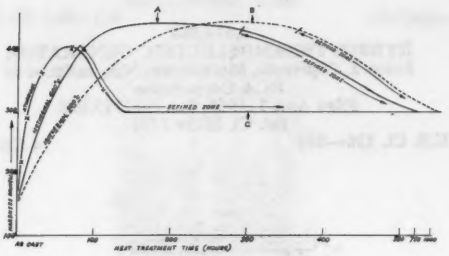
A sintered refractory metal carbide composition is provided comprising about 35 v/o to 70 v/o of at least one refractory metal carbide selected from the group consisting of WC, CbC, VC and TaC dispersed substantially uniformly through a cupro-nickel matrix making up essentially the balance, the cupro-nickel matrix consisting essentially by weight of about 55% to 90% copper and the balance essentially about 45% to 10% by weight of nickel. The cupro-nickel alloy matrix is preferably age-hardenable. The composition is particularly adapted to the manufacture of non-magnetic wear and corrosion resistant elements for use in saline environments, such as a mating ring in rotating mechanical seal applications in torpedoes and the like.

3,674,576
ALLOY CAST IRON

Charles Robert van-der Ben, Ashton-under-Lune, and Joseph Albert Pope, Bramhall, England, assignors to Mirrlees Blackstone Limited

Continuation of application Ser. No. 619,743, Mar. 1, 1967, which is a continuation-in-part of application Ser. No. 582,161, Sept. 26, 1966, which in turn is a continuation of application Ser. No. 311,224, Sept. 24, 1963. This application Oct. 2, 1969, Ser. No. 869,440
Claims priority, application Great Britain, Sept. 25, 1962, 36,321/62
Int. Cl. C22c *37/00, 37/04*
U.S. Cl. 148—35 11 Claims

A heat-treated alloy cast iron consisting essentially of 10 to 15% of a nickel equivalent component consisting of a metal selected from the group consisting of nickel, nickel equivalent metals and mixtures thereof, at least about 8% of said alloy being nickel, said nickel equivalent metals being present in an amount not over about 8% of said alloy and being selected from the group consisting of copper and manganese, the amount of copper not exceeding about 3% of said alloy, the amount of manganese, when present as an intended alloy addition, not exceeding about 2% of said alloy, the balance of the alloy consisting essentially of iron and carbon, and any manganese present as an incidental constituent, up to 1% of said alloy, not being included in said nickel equivalent metal amount, the presence of chromium being limited to a residual amount not exceeding about 0.07% of said alloy, all percentages being by weight, said alloy having been cast into an unstable austenitic structure which may contain martensite, then heat-treated to transform said austenitic cast iron into a baino-martensitic state of maximum hardness, said heat-treatment being continued for a sufficient length of time to cause a decrease in hardness into the range below said maximum, to increase mechanical strength, thermo-stability and toughness to the alloy.



3,674,577
FABRICATION OF STEEL STRUCTURES BY WELDING

Joachim Degenkolbe, Mulheim, and Bruno Musgen, Oberhausen, Germany, assignors to Huttenwerk Oberhausen AG, Oberhausen, Germany

Filed Sept. 18, 1969, Ser. No. 859,022
Claims priority, application Germany, Sept. 20, 1968, P 17 83 028.3
Int. Cl. C21d *1/00;* B23p *11/00*
U.S. Cl. 148—143 3 Claims

A welded steel structure, especially for low temperature or cryogenic installations, consisting of water-quenched or oil-quenched (tempered or hardened) steel bodies of the following composition by weight:

0.06 to 0.24% carbon;
up to 0.60% silicon;
0.40 to 1.60% manganese;
up to 3.5% nickel;
up to 1.0% chromium;
up to 0.20% vanadium;
up to 0.5% molybdenum; and
balance iron.

Upon welding the body is found to be free from a ductility or toughness minimum, as measured by the notched-body impact technique or drop-weight test at a location from about 3–10 mm. from the weld seam.

3,674,578
WATER-IN-OIL EMULSION TYPE BLASTING AGENT

George R. Cattermole, Cedar Rapids, Iowa, Austin M. Cummings, Martinsburg, W. Va., and William M. Lyerly, Hagerstown, Md., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

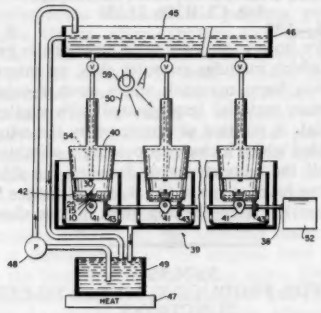
No Drawing. Filed Feb. 17, 1970, Ser. No. 12,126
Int. Cl. C06b *19/00*
U.S. Cl. 149—2 10 Claims

A water-in-oil emulsion type blasting agent containing inorganic oxidizing salt, nitrogen-base salt, water, water-insoluble organic fuel that forms a continuous oil phase, lipophilic emulsifier and gas bubbles.

3,674,579
METHOD OF FORMING ELECTRICAL CONDUCTORS

Richard M. Clinehens, Dayton, John K. Stewart, Jr., Kettering, and Robert W. Ditmer, Englewood, Ohio, assignors to The National Cash Register Company, Dayton, Ohio

Filed July 2, 1970, Ser. No. 51,808
Int. Cl. C23f 1/00
U.S. Cl. 156—5 4 Claims

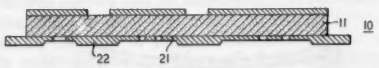


The present invention relates to a method of forming electrical conductors to selected regions of a semiconductor wafer. An aluminum film of approximately 10,000 angstroms is evaporated upon a silicon dioxide insulative evaporation mask which has been formed on a silicon wafer. A conductor mask is formed upon selected areas of the aluminum film. The masked aluminum film is placed upon a spinner. Phosphoric acid is continuously poured near the center of the masked metal film. The masked aluminum film is spun for a period of approximately four minutes, to remove the portions of the aluminum film which are not coated by the conductor mask, in order to form electrical conductors in contact with selected regions of the silicon wafer.

3,674,580
ZIRCONIUM MASK FOR SEMICONDUCTOR FABRICATED USING ALKALINE ETCHANTS

William Charles Erdman, Bethlehem, Pa., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 8, 1970, Ser. No. 35,746
Int. Cl. C23f 1/04
U.S. Cl. 156—13 4 Claims



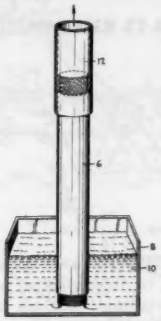
A mask comprising a thin film of zirconium metal is applied directly to a semiconductor surface for use with strong alkaline etchants, such as potassium hydroxide, of the type used for antisotropic etching. Typically, a zirconium film of several hundred angstrons thickness is applied using high energy means including sputtering and an electron gun.

3,674,581
PRODUCTION OF FIBER REINFORCED COMPOSITES

Ilmar L. Kalnin, Millington, and George J. Breckenridge, Roselle, N.J., assignors to Celanese Corporation, New York, N.Y.

Filed Apr. 1, 1969, Ser. No. 812,192
Int. Cl. B29c 27/00
U.S. Cl. 156—84 9 Claims

An improved process is provided for the formation of essentially solid fiber reinforced composite bodies. The process is particularly suited for the formation of composite bodies having a high volume of fibrous reinforcing medium (e.g. carbonaceous filaments) distributed in a matrix (e.g. an epoxy resin) in a highly oriented relationship. In the production of composite bodies the fibrous reinforcing medium while present within a heat-shrinkable

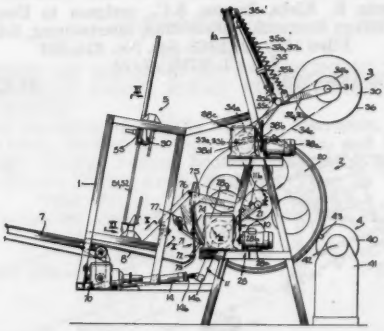


mold is compacted by the application of heat and a flowable matrix-forming material subsequently is introduced into the mold and solidified to a moldable B-stage or rigid C-stage consistency. The essentially solid composite bodies formed according to the invention are useful in the formation of high performance structural elements or as high performance structural elements.

3,674,582
METHOD OF BUILDING AN ANNULAR BREAKER

Jean Leblond, Compiegne, Oise, France, assignor to Uniroyal Englebert France S.A., Paris, France

Original application Aug. 2, 1968, Ser. No. 749,810, now Patent No. 3,547,732, dated Dec. 5, 1970. Divided and this application Apr. 8, 1970, Ser. No. 32,492
Claims priority, application France, Aug. 11, 1967, 117,824
Int. Cl. B29h 17/20
U.S. Cl. 156—133 6 Claims



A breaker building method and apparatus in which a continuous strip of breaker material, coming from a single source, is severed into strip portions on a main drum. Alternate ones of these strip portions are transferred directly from the main drum to a breaker building drum while the remaining ones of the strip portions are transferred first to an intermediate member and from there to the breaker building drum in such a manner that the cords of successive breaker plies on the breaker building drum form a crossing angle with each other.

3,674,583

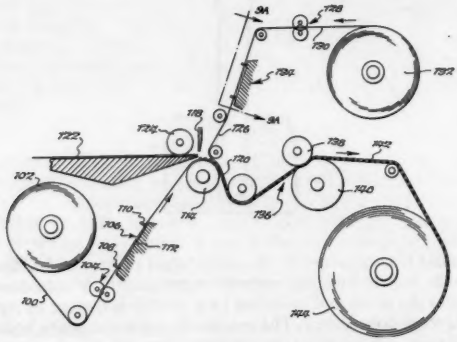
METHOD FOR THE PREPARATION OF INTEGRATED NETTINGS AND LAMINATES

Walter F. Allport, Stamford, Conn., assignor to International Paper Company, New York, N.Y.

Application Oct. 4, 1968, Ser. No. 777,944, now Patent No. 3,575,777, dated Apr. 20, 1971, which is a continuation-in-part of application Ser. No. 600,899, Dec. 12, 1966. Divided and this application Oct. 26, 1970, Ser. No. 84,162

Int. Cl. B32b 5/08, 5/12

U.S. Cl. 156—167 24 Claims



An integrated netting made from sets of paper or plastic warp and weft strands adhered together between the intersections of the warp and weft strands to form a tough, flexible tear-resistant netting. The netting may be rendered moisture or vapor-proof through the additional lamination of paper or plastic sheet material. Processes and equipment for forming multiple strands and various combinations of warp and weft strands so as to vary the charcateristics and properties of the netting are shown.

3,674,584

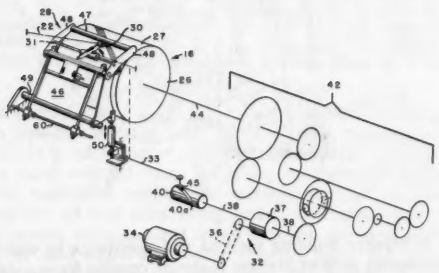
METHOD AND APPARATUS FOR POSITIONING A CONTINUOUS THREAD OR CORD ON A SUPPORT SURFACE

Norman E. Klein, Inman, S.C., assignor to Deering Milliken Research Corporation, Spartanburg, S.C.

Filed May 22, 1969, Ser. No. 826,889

Int. Cl. B29h 17/28

U.S. Cl. 156—173 21 Claims



A method and apparatus for positioning a continuous length of thread or cord on a support surface in a desired pattern wherein the cord is positioned on the support surface with means including a cord guide mechanism moving relative to the support surface while applying rolling pressure against the cord to minimize movement of the cord on the surface due to tension forces acting on the cord and to prevent dislocation of the cord with respect to the support surface.

3,674,585

METHOD OF MAKING AN AIRCRAFT WING STRUCTURE

Leo J. Windecker, Midland, Tex., assignor to Windecker Research, Inc., Midland, Tex.

Filed Oct. 7, 1969, Ser. No. 864,425

Int. Cl. B32b 31/00

U.S. Cl. 156—182 5 Claims

A generally hollow aircraft wing structure is provided, the wall of which includes an outer skin, an intermediate layer including foam material, and a strengthening layer of glass fibrous material impregnated with synthetic resinous material. A method of constructing the wing structure is provided which includes providing a suitably shaped mold for half the wing structure, forming the skin in the mold, bonding foam strips to the skin, and thence bonding to the foam strips strengthening glass fibrous sheets.

3,674,586

METHOD FOR PRODUCING METAL-TO-CERAMIC JUNCTIONS

Hans Rimkus, deceased, late of Berlin, Germany, by Elsa Rimkus, sole heir, Berlin-Dahlem, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Continuation-in-part of application Ser. No. 501,846, Oct. 22, 1965. This application Sept. 15, 1969, Ser. No. 864,568

Claims priority, application Germany, Dec. 8, 1964, S 94,504

Int. Cl. B21d 21/06

U.S. Cl. 156—196 5 Claims

Method for producing a metal-to-ceramic junction includes the steps of depositing an adhesive layer on a ceramic body on a surface portion thereof where the junction is to be made, and deforming the metal against the body at the location of the surface portion at a relatively high speed and with a relatively strong force.

3,674,587

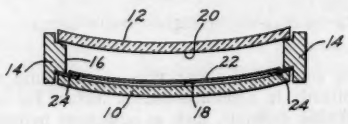
PRODUCING POLARIZING OPTICAL DEVICES AND PRODUCT THEREOF

Norman U. La Liberte, Woodstock, Conn., assignor to American Optical Corporation, Southbridge, Mass.

Filed May 6, 1970, Ser. No. 35,132

Int. Cl. B29f 1/10; B32b 27/04; B29c 6/00

U.S. Cl. 156—245 7 Claims



A laminated optical element is produced by prepositioning a polarizing sheet, which has been coated on both sides with adhesive compatible with the encasing material, in a mold so as to accurately space the polarizing sheet from the inner mold surfaces, injecting a monomer of allyl diglycol carbonate into the mold so as to completely encase the polarizing sheet, and then curing the laminate. The process includes producing stress free castings capable of being subjected to subsequent color accepting treatment and various finishing processes. The laminated product provides a fully encased polarizing sheet with a thin layer of uniform thickness of the polymer on the front side of the polarizing sheet which may be readily finished for optical devices.

3,674,588

METHOD OF RECORDING AND TRANSFERRING DESIGN INDICIA

Jan Bernard Lambrechts, Antwerp, Belgium, assignor to Agfa-Gevaert, Mortsel, Belgium

No Drawing. Filed Oct. 2, 1968, Ser. No. 764,631
Claims priority, application Great Britain, Oct. 2, 1967, 44,794/67
Int. Cl. B41m 5/26
U.S. Cl. 156—230 9 Claims

A heat-sensitive recording layer of the type disclosed in USP 3,476,937 and formed essentially of a dispersion of solid hydrophobic thermoplastic polymer particles in a hydrophilic binder, after exposure to a heat pattern to reduce the water permeability in the heated areas of the layer and after washing to remove from the layer the areas thereof of unchanged water-solubility, leaving the heated area thereof in relief, is contacted with a receiving material and substantial mechanical pressure is applied to such remaining portions to cause them to adhere to the receiving material so that when the recording layer and the receiving material are separated by peeling, a stratum of the remaining portions of the recording layer remains adhered to the receiving material forming thereon a reproduction of the original heat pattern applied to the heat-sensitive recording layer. Either or both of the surfaces of the recording layer and receiving material can be provided with a weakly adhesive layer to facilitate transfer of the stratum of the recording layer to the receiving material.

3,674,589

METHOD OF FABRICATION AND REINFORCING HIGH SOLIDS-CONTAINING MATERIALS

Carl K. Schaab, Dayton, George T. Weyrauch, Miamisburg, and Terry R. Davis, Spring Valley, Ohio, assignors to The National Cash Register Company, Dayton, Ohio

No Drawing. Filed Feb. 28, 1969, Ser. No. 803,478
Int. Cl. B29c 31/00
U.S. Cl. 156—245 18 Claims

This disclosure is directed to an improved method for preparing fabric-reinforced molded plastic articles and involves the utilization of at least one prebonded composite of a fabric reinforcing material and a coherent layer of mold release material which is substantially impervious to non-solvent liquids, the two being adhered by an adhesive whose bond strength is diminished significantly subsequent to molding. The diminution in the adhesive bond which occurs during the molding and/or curing allows the mold release sheet to be removed readily from the fabric (surface) reinforced molded article without any significant surface deformation thereto. Both woven and non-woven fabrics can be employed; but for most molded articles, the use of woven cloth or woven fabric is preferred. In the case of molded circuit boards, a preferred fabric reinforcement is "Dacron" cloth; a preferred solid mold release sheet material is "Mylar" (polyethylene glycol terephthalate) a preferred adhesive to prebond the reinforcing cloth to the mold release sheet is a compatible polyester adhesive and a preferred class of molding plastics is epoxy resins.

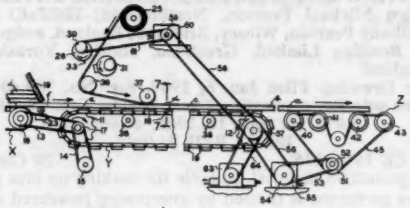
3,674,590

MEANS AND METHOD FOR APPLYING FACING STRIPS TO CORES

John G. Holman, Fort Lauderdale, Fla., assignor to Roberts Consolidated Industries, Inc., Industry, Calif.

Filed Aug. 31, 1970, Ser. No. 68,380
Int. Cl. B32b 31/00
U.S. Cl. 156—252 6 Claims

A means and method for the continuous application of a flexible facing strip of indefinite length to one face of each of a succession of cores while all are advancing in end to end engagement through a fixed path. The method involves (1) drawing the strip from a supply roll to overlie the top face of a plurality of cores for adhesion thereto while advancing end to end in a procession, (2) forming lines of future rupture across the strip, while advancing toward the cores, at points which are coincident with the trailing ends thereof, and (3) thereafter tensioning the



advancing strip, as each core nears the end of its movement through a fixed path therefor, at points on opposite sides of each line of rupture, transversely of the strip to produce thereat a clean severance thereof whereby to free each core, in turn, for removal from those to the rear thereof.

3,674,591

SURFACE DEFORMATION IMAGING PROCESS

Sherman H. Boyd, Jr., La Mesa, Calif., assignor to Stromberg DatagraphiX, Inc., San Diego, Calif.

No Drawing. Filed Nov. 28, 1969, Ser. No. 880,970
Int. Cl. G03c 9/08
U.S. Cl. 156—272 14 Claims

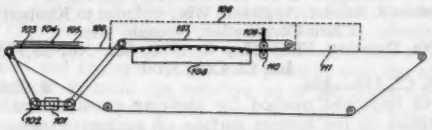
An improved imaging process for electron beam recording is disclosed. In this process, a layer of a highly viscous photopolymer is exposed to an electron beam in a vacuum. It has been found that the electron beam simultaneously causes the formation of a surface deformation image while polymerizing the material in exposed areas. Thus, an instantaneous visible image is formed with no post processing of the material required. Background areas of the material may be polymerized by exposure to suitable radiation, such as ultra violet light, in the substantial absence of oxygen. This produces a strong, easily handled imaged sheet.

3,674,592

METHOD OF BONDING AN INTERLINING TO A GARMENT USING STRAY FIELD DIELECTRIC HEATING

Sydney Jacobson, Woodlands, Oakdale, Harrogate, Denis Knowles, Barwick-in-Elmet, near Leeds, and Derek Parker, Farsley, Pudsey, England, assignors to Montague Burton Limited, Leeds, England

Filed May 13, 1969, Ser. No. 824,184
Claims priority, application Great Britain, May 20, 1968, 23,909/68
Int. Cl. H05b 9/00
U.S. Cl. 156—274 7 Claims



In the manufacture of garment parts the interlining is bonded to the top cloth by pressing the two components

together and exposing heat-activated material associated with one or both components to the action of an electric current of frequency at least one megacycle per second.

3,674,593

METHOD OF MAKING A PROTECTIVE LAMINATE HAVING AN INTERPOSED POWERED LAYER

William Michael Pearson, Northowram, Halifax, and Anthony Pearson, Wibsey, Bradford, England, assignors to Bondina Limited, Greetland, Halifax, Yorkshire, England

No Drawing. Filed Jan. 6, 1969, Ser. No. 789,406
Claims priority, application Great Britain, Jan. 19, 1968, 3,099/68; Sept. 18, 1968, 44,405/68
Int. Cl. B32b *31/00*
U.S. Cl. 156—276 10 Claims

A protective material, suitable for making up into protective garments, is formed by interposing powdered activated charcoal and powdered thermoplastic adhesive between two substrates and heat-sealing the assembly together. A microfine thermoplastic powder may also be interposed, and this has the effect of counteracting undesirable effects due to any dust which may be present in the charcoal.

3,674,594

METHOD OF MANUFACTURING A MATERIAL SIMILAR TO TEXTILE, CONTAINING PAPER

Leif R. Persson, Billingsfors, Sweden, assignor to AB Billingsfors-Langed, Billingsfors, Sweden

No Drawing. Filed May 8, 1969, Ser. No. 823,151
Claims priority, application Sweden, May 29, 1968, 7,219/68
Int. Cl. B32b *31/00*
U.S. Cl. 156—299 7 Claims

This invention relates to production of a substitute for textile material. The invention comprises the steps of impregnating and/or coating porous fibre material preferably selected from the group consisting of (1) soft crepe tissue paper having a surface weight of 10–50 g./m.^{2} and a crepe degree of 10–50%, and (2) nonwoven fabric, for example having a surface weight of 10–50 g./m.^{2}, with an adhesive resinous elastomer in molten state, preferably comprising a plasticized mixture of hydrocarbon resin, for example low molecular styrene resin and resins of low molecular polythene or ethylene vinyl acetate copolymer type, forming an adhesive layer of said resinous elastomer on the surface of said porous fibre material and subsequently covering said adhesive layer on one or both sides by pressing said layer together with stretchable, porous tissue paper, preferably crepe tissue paper, having a surface weight of 10–50 g./m.^{2} and a crepe degree of 10–50%, or fibres or cellulose or of synthetic character which are blown onto or applied in some other manner. The composite material thus produced is a very good substitute for textile material. It is strong and durable and relatively easy to manufacture.

3,674,595

METHOD FOR APPLYING PRESSURE SENSITIVE ADHESIVE TO SANITARY NAPKINS

Robert J. Roeder, Appleton, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

No Drawing. Filed May 8, 1970, Ser. No. 35,903
Int. Cl. C09j *5/00*
U.S. Cl. 156—306 4 Claims

An improved method for applying pressure sensitive adhesive to the bottom surface of sanitary napkins. A pressure sensitive adhesive mass carried on one side of conventional protective release paper is first adhered to the napkin surface. Heat and pressure are then applied to the other side of the release paper. This operation attaches the adhesive more firmly to the porous napkin surface, while reducing the force needed to strip the smooth protective paper from the adhesive when preparing the napkin for use.

3,674,596

METHOD OF LAMINATING UNTREATED WOOD TO WOOD TREATED WITH FIRE RETARDANT MATERIAL

Lawrence O. McMinimy, Lewiston, Idaho, assignor to Potlatch Forests, Inc., San Francisco, Calif.

No Drawing. Filed Mar. 23, 1970, Ser. No. 22,045
Int. Cl. C09j *5/06*
U.S. Cl. 156—321 4 Claims

A method of laminating lumber wherein an outer layer in the laminated assembly is treated with a fire retardant salt solution. The laminating process involves pre-heating of the surfaces to be bonded, the application of a thermosetting adhesive to the untreated surface, and immediate application of pressure to hold the surfaces in intimate contact during substantial curing of the adhesive. The resulting product has particular structural and practical features which are attributed to the method.

3,674,597

CHLORINATED POLYETHYLENE-ORGANIC POLYISOCYANATE ADHESIVE FOR LAMINATING CHLORINATED POLYOLEFIN FILM OR SHEET MATERIALS TO FABRIC

Joseph Drasner, Rockaway, N.J., assignor to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed July 20, 1970, Ser. No. 56,738
Int. Cl. B32b *27/28, 31/00*
U.S. Cl. 156—331 7 Claims

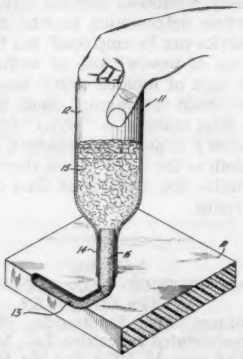
An improved adhesive for laminating preformed, chlorinated polyolefin film or sheet material to a fabric substrate, wherein such adhesive consists essentially of an admixture of (1) a substantially amorphous chlorinated polyethylene and (2) from about 25 to 50 parts by weight per 100 parts of (1) of an organic polyisocyanate.

3,674,598

APPARATUS FOR PRODUCING A THREE-DIMENSIONAL WORK OF ART

Richard J. Mayer, 790 Smith Road, Parsippany, N.J. 07054, and Benjamin Kinberg, 425 Riverside Drive, New York, N.Y. 10027

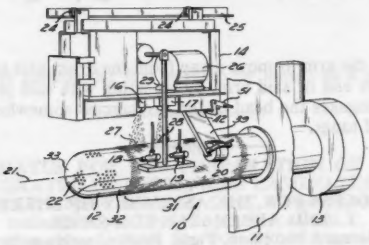
Filed July 23, 1970, Ser. No. 57,615
Int. Cl. B44b *1/00*; B44c *1/22*
U.S. Cl. 156—345 4 Claims



Three-dimensional pictures and the like are formed by applying a mix of ink and solvent to selected portions of the surface of a body of expanded polystyrene to simultaneously etch and color the body at the point of application. The ink and solvent mix is applied with a

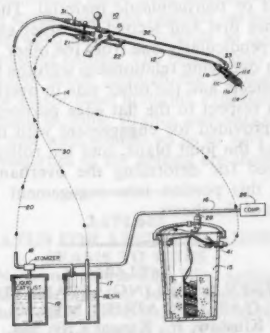
hand held applicator having a liquid reservoir containing the mix and a porous fiber tip through which the mix is applied to the body of expanded polystyrene.

3,674,599
PREFORM ROLLER
Arthur J. Wiltshire, Cleveland, Ohio, assignor to Structural Fibers, Inc., Chardon, Ohio
Filed June 5, 1970, Ser. No. 43,736
Int. Cl. B32b *31/20*
U.S. Cl. 425—80 **11 Claims**



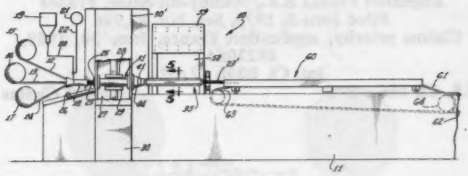
A method and apparatus for manufacturing an improved fiber preform which may be used in the subsequent bag molding of fiber reinforced plastic articles such as tanks or the like. The method comprises the steps of randomly depositing short reinforcing fibers on a form, binding the fibers together with a settable resin binder, and rolling the resin coated fibers on the form into a dimensionally uniform porous mat. The apparatus includes a rotatable lay-up form, means for randomly depositing the reinforcing fibers in a porous layer on the form, means to coat the fibers with a settable resin binder, and means to progressively press the fibers along the length of the form into a uniform wall thickness.

3,674,600
APPARATUS FOR DISPENSING CATALYST COATED FIBERS AND CEMENTITIOUS MATERIAL ONTO A SURFACE
James B. Winn, Jr., Wimberley, Tex., assignor to The Archilithic Co., Dallas, Tex.
Filed Mar. 12, 1969, Ser. No. 806,355
Int. Cl. B29j *5/00*
U.S. Cl. 156—166 **4 Claims**



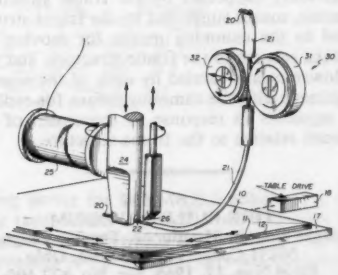
Glass fiber strands coated with a cementitious material are forcefully projecting from a source by centrally entraining continuous fiber strands enshrouded by a liquid catalyst in the cementitious material for deposit onto a receiving surface as the catalyst mixes with the cementitious material.

3,674,601
AUGMENTED CURING OF REINFORCED PLASTIC STOCK
William Brandt Goldsworthy, Palos Verdes Estates, Calif., assignor to Glastrusions, Inc., Torrance, Calif.
Continuation-in-part of application Ser. No. 648,347, June 23, 1967, now Patent No. 3,556,888. This application Aug. 7, 1970, Ser. No. 61,934
Int. Cl. B29c *19/02*; B29h *9/00*
U.S. Cl. 156—380 **8 Claims**



A pultrusion machine and process wherein a composite fibre strand is pulled through successive stages of impregnation, curing, and forming. At the impregnation stage liquid thermosetting resin is mixed with hardener and the fiber strand saturated with the mixture and rough formed. During the initial curing stage a cure is started throughout the resin mixture by use of electrical wave energy. Before final curing, the saturated strand is pulled through the finish die where it is externally heated and wherein the saturated strand is given its final cross-sectional shape and external finish, and cured to completion immediately prior to final emergence at the exit end of the finish die.

3,674,602
APPARATUS FOR MAKING WIRE SCRIBED CIRCUIT BOARDS
Raymond J. Keogh, Huntington, and Frank J. Wilczek, Glen Oaks, N.Y., assignors to Photocircuits Corporation, Glen Cove, N.Y.
Filed Oct. 9, 1969, Ser. No. 865,008
Int. Cl. B29c *19/02*
U.S. Cl. 156—380 **11 Claims**

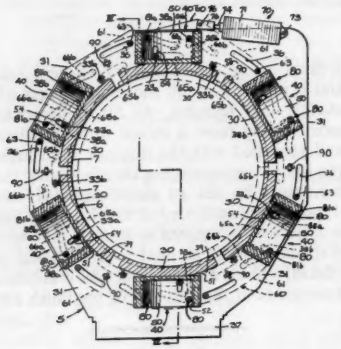


A technique and apparatus for making wired interconnection boards for electrical components. The insulated wire pattern is formed by tacking the wire on an adhesive coated dielectric base using a tacking head having a bifurcated end arranged to heat and partially cure the adhesive and to mold the adhesive so it physically captures the wire. The tacking head is associated with a cutter and initial wire feed mechanism. The tacking head and associated apparatus can be oriented in any one of four directions while the dielectric base is moved on a table which has two degrees of freedom.

After the conductor pattern is formed on the dielectric base, the conductor pattern is permanently secured by

lamination encapsulation or the like so that the conductors are interior of the board. Holes are drilled so that the conductor ends form part of the hole walls and the holes are then metallized to bring the conductor terminations to the surface.

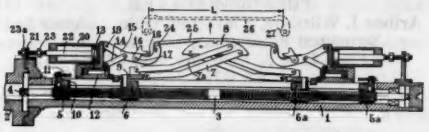
3,674,603
EXPANSIBLE AND CONTRACTIBLE TRANSFER RING
Jean Leblond, Compiegne, France, assignor to Uniroyal Engelbert France S.A., Neuilly-sur-Seine, France
Filed June 3, 1970, Ser. No. 42,986
Claims priority, application France, June 30, 1969, 6922084
Int. Cl. B29h *17/02*
U.S. Cl. 156—394 **10 Claims**



An expansible and contractible transfer ring for transferring a breaker-tread assembly from a building drum in a tire building machine to a tire carcass mounted on a shaping mechanism. The transfer ring includes a generally cylindrical frame structure, a plurality of radially movable arcuate segments arranged in a circumferential sequence within the frame structure, annular camming means movably supported by the frame structure about the segments, means supported by the frame structure and connected to the camming means for moving the camming means relative to the frame structure, and respective cam follower means carried by each of the segments and in engagement with the camming means for radially moving the segments in response to movement of the camming means relative to the frame structure.

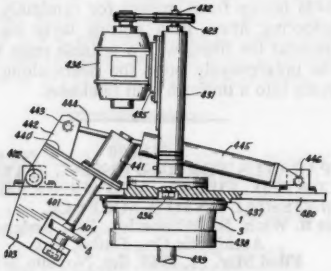
3,674,604
TIRE BUILDING DRUM
Georges Gazuit, Montlucon, France, assignor to NRM Corporation, Akron, Ohio
Filed Nov. 17, 1969, Ser. No. 877,400
Claims priority, application France, Nov. 27, 1968, 175,508
Int. Cl. B29h *17/16, 17/26*
U.S. Cl. 156—415 **13 Claims**

In this Rind-type drum for making tires described in my co-pending application Ser. No. 617,658 now abandoned in favor of applicant's continuation application Ser. No. 28,281, filed Apr. 22, 1970, entitled "Tire Building Machine," the bead clamping means consist for each flange supporting same of an annular set of pivoted arms each formed with an outer end bent radially away from the drum axis, this end carrying a pivoted finger formed with a forked outer end and radially urged away from the drum axis by a spring reacting against said arm, and a link connecting said arm to the movable end of a double-acting cylinder mounted in said flange at a point nearer to the drum axis than the fulcrum of said arm, the movement of the operative end of said cylinder towards the transverse plane of symmetry of the drum



causing the arm to move away from the drum axis so that the outer end of said arm, by co-acting with said pivoted finger, engages the bead of the tire carcass somewhat like a pair of tongs.

3,674,605
PROCESS FOR THE ASSEMBLY OF SHEETS AND APPARATUS FOR SAME
Bernard Baumann, Paris, France, assignor to L'Aluminium Francais
Application Mar. 10, 1969, Ser. No. 816,143, which is a continuation-in-part of application Ser. No. 503,842, Oct. 23, 1965. Divided and this application Nov. 28, 1969, Ser. No. 882,378
Int. Cl. B32b *3/04*
U.S. Cl. 156—479 **10 Claims**

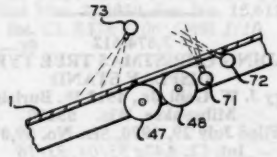


A system for joining flat portions of sheets with a joint blank formed of thermoplastic material. The joint blank initially defines first and second flat sides extending substantially perpendicularly one from the other. One flat side is disposed in overlying relationship with the flat edge portions of the sheets and the other side in overhanging relationship with respect to the flat edge portions. A rotating roller die is provided for engagement with the overhanging portion of the joint blank, and the roller die is gradually displaced for deforming the overhanging portion for molding this portion into engagement with the flat edge portions of the sheets.

3,674,606
CONTAINER LABELING APPARATUS WITH GASEOUS AIRJET MEANS
William G. Kinslow, Jr., Kansas City, Mo., assignor to Phillips Petroleum Company
Filed Oct. 23, 1969, Ser. No. 868,799
Int. Cl. C09j *5/09*
U.S. Cl. 156—497 **9 Claims**

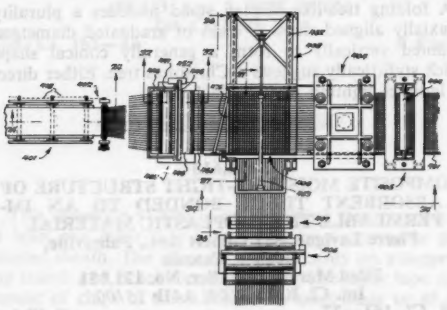
A method and apparatus are disclosed in which an end of a continuous label is affixed to a container and the container is advanced from a first position at a point at

which the label on the container is severed from the continuous label. The severed end of the continuous label is



made to assume the first position by means of a gaseous jet.

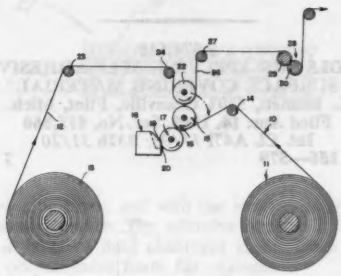
3,674,607
APPARATUS FOR THE PREPARATION OF INTEGRATED NETTINGS AND LAMINATES
Walter F. Allport, Stamford, Conn., assignor to International Paper Company, New York, N.Y.
Application Oct. 4, 1968, Ser. No. 777,944, now Patent No. 3,575,777, dated Apr. 20, 1971, which is a continuation-in-part of application Ser. No. 600,899, Dec. 12, 1966. Divided and this application Oct. 26, 1970, Ser. No. 84,203
Int. Cl. B05c *1/16;* B32b *31/12*
U.S. Cl. 156—511 **3 Claims**



An integrated netting made from sets of paper or plastic warp and weft strands adhered together between the intersections of the warp and weft strands to form a tough, flexible tear-resistant netting. The netting may be rendered moisture or vapor-proof through the additional lamination of paper or plastic sheet material. Processes and equipment for forming multiple strands and various combinations of warp and weft strands so as to vary the characteristics and properties of the netting are shown.

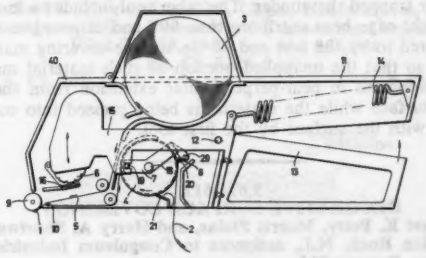
3,674,608
APPARATUS FOR APPLYING ADHESIVE SEAMS TO WEBS
Ernst Daniel Nystrand, Green Bay, Wis., assignor to Paper Converting Machine Co., Inc., Green Bay, Wis.
Filed July 6, 1970, Ser. No. 52,344
Int. Cl. B32b *31/12, 31/04*
U.S. Cl. 156—553 **3 Claims**

Apparatus is disclosed for applying adhesive seams to high speed webs for securing them together. An even coating of the adhesive, heated, if necessary is applied to a rotating gravure roll; and one web is fed in partial wrapping engagement about a rotating plate cylinder having a raised transfer bar fixed to its periphery. As the rolls rotate, the transfer bar engages the traveling web and elevates it above the surface of the plate cylinder and into contact with the gravure roll to deposit a seam of adhesive to the outer convex surface of the web according to the



pattern defined by the transfer bar. The two webs are then pressed together and secured by the adhesive. Adhesive seams may also be applied to both webs, if desired, with the applied seams being in register with each other, then pressed together.

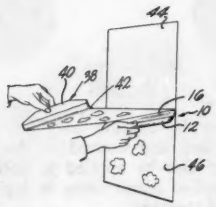
3,674,609
LABELING DEVICES
Kurt Schrotz, Brentanostr. 29B, and Werner Becker, Hauptstr. 25, both of Hirschhorn (Neckar), Germany
Filed Aug. 28, 1970, Ser. No. 67,708
Claims priority, application Germany, Sept. 4, 1969, P 19 44 857.8
Int. Cl. B65c *11/00*
U.S. Cl. 156—577 **6 Claims**



A labeling device for labels which adhere to a support or carrying tape, which is provided with recesses or cut-away marginal portions which are arranged with a spacing corresponding to the spacings between the front edges of the label, and the device is equipped with a transport roller drawing off the support tape step-by-step for the advance of a label, the transport roller being arranged to bring the label in a dispensing position which is to be held precisely and on its periphery is provided with projections which fit into the recesses or cut-away marginal portions of the carrier tape and can be driven in steps at a constant angle and is provided with a non-reversing ratchet, characterised in that a transport part is arranged so as to swing about the axis of rotation of the transport roller and a gripping piece which lies resiliently against the periphery of the transport roller is so pivotally mounted that on movement of the part a driving abutment, of the gripping piece, which is located adjacent to the projections located on a periphery of the transport roller, strikes against the projection and thus presses the gripping piece against the

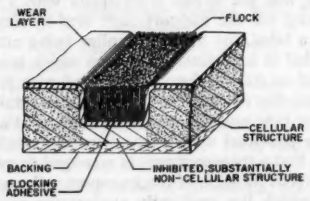
support tape lying on the periphery of the transport roller and drives the transport roller with the support tape through a distance determined by the pivoting angle of the part and in that on movement of the part against the transport direction of the driving abutment slides over the projections and raises the gripping piece from the support tape.

3,674,610
TOOLS FOR APPLYING SELF-ADHESIVE SURFACE COVERING MATERIAL
Donald L. Bennett, 5501 Granville, Flint, Mich. 48505
Filed Apr. 14, 1969, Ser. No. 815,860
Int. Cl. A47l *17/06*; B32b *31/20*
U.S. Cl. 156—579 **7 Claims**



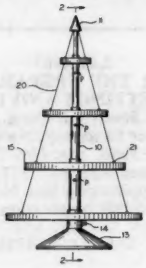
A pair of manually operated tools for holding and pressing self-adhesive surface covering material into adhesive contact with a flat surface. One tool includes a blade having a long, straight, thin edge, slightly curved about its longitudinal axis, and is employed to press self-adhesive surface covering material into adhesive contact with a flat surface. The corners of the blade at the ends of the edge may be rounded for ordinary use, or square for use in corners. An extendable sharp point is provided for puncturing the covering material to permit the escape of air trapped thereunder. The other tool includes a long, straight edge bent not more than 90° and disposed to be adhered to by the free end of the surface covering material, so that the unapplied portion of such material may be supported in near-perpendicular extension from such flat surface while the material is being pressed into contact with the surface by the first tool.

3,674,611
DECORATIVE SURFACE COVERINGS
Robert K. Petry, Morris Plains, and Harry A. Shortway, Glen Rock, N.J., assignors to Congoleum Industries, Inc., Kearny, N.J.
Filed Apr. 10, 1970, Ser. No. 27,374
Int. Cl. B32b *5/14, 5/16, 5/18*
U.S. Cl. 161—63 **23 Claims**



A resinous surface covering having on the surface thereof a plurality of raised cellular areas and a plurality of non-elevated areas adjacent to said raised areas, the non-elevated areas having flocked textile fibers adhesively embedded therein; the height differential between the elevated and non-elevated areas being achieved by either a mechanical or chemical embossing technique.

3,674,612
FOLDING CHRISTMAS TREE TYPE OF DISPLAY STAND
Gerry J. W. Gehl, Jr., 4512 W. Burleigh St., Milwaukee, Wis. 53210
Filed July 29, 1970, Ser. No. 59,071
Int. Cl. A47g *33/04, 33/16*
U.S. Cl. 161—23 **5 Claims**

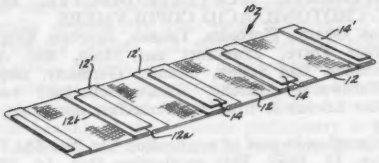


A folding tree-like display stand includes a plurality of axially aligned rings or disks of graduated diameters, mounted vertically to form a generally conical shape which stylistically suggests a Christmas tree. Either direct or indirect lighting may be included.

3,674,613
COMPOSITE MOISTURE-TIGHT STRUCTURE OF ABSORBENT TISSUE BONDED TO AN IMPERMEABLE THERMOPLASTIC MATERIAL
Pierre Lavigne, 527 Gilbert Ave., Fabreville, Quebec, Canada
Filed Mar. 4, 1971, Ser. No. 121,081
Int. Cl. B32b *3/04*; A41b *15/00*
U.S. Cl. 161—37 **8 Claims**

The disclosure herein describes a moisture-tight handkerchief consisting of a first layer of soft absorbent tissue material, such as paper or cloth, and of a second layer of impermeable flexible material, preferably a thermoplastic material, such as polyethylene or polyvinylchloride; both layers are bonded together and, in one embodiment of the invention, the layers are then folded to form an impermeable moisture-containing pocket.

3,674,614
UNITARY LABEL ASSEMBLY OF INTERLINKED LABELS
John Glenn Templeton, Grand Rapids, Mich., assignor to Rospatch Corporation, Grand Rapids, Mich.
Filed Mar. 2, 1970, Ser. No. 15,617
Int. Cl. B37b 7/06; G09f 3/10
U.S. Cl. 161—39 6 Claims



A unitary label assemblage formed of labels interlinked by an adhesive forming frangible nexuses between the label edges, allowing selective individual label separation by breakage of the nexus.

3,674,615
INSULATING TAPE AND METHOD OF FABRICATION THEREOF
Jean Dardenne, 16 Allee des Aubepines, Lovernal, Belgium
Continuation-in-part of application Ser. No. 742,766, July 5, 1968. This application Dec. 30, 1970, Ser. No. 102,812
Claims priority, application Belgium, July 20, 1967, 46,433; Apr. 2, 1968, 56,604
Int. Cl. B32b 3/06
U.S. Cl. 161—49 9 Claims

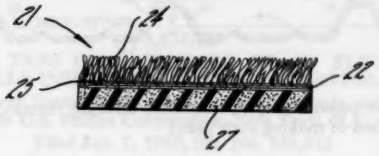
This invention relates to an insulating tape comprising at least one inner tape surrounded by a porous or perforated sheath. The inner tape slides easily on a supporting sheath and is not secured thereto. The inner tape may consist of chips of mica bonded to each other or of agglomerated mica flakes without the use of glue or varnish. The supporting sheath may consist of synthetic felt, polyester felt, paper, fabric, or film.

3,674,616
ORNAMENTAL ARTICLE
Laurence M. Howard, 370 E. 76th St., New York, N.Y. 10021
Filed Dec. 4, 1970, Ser. No. 95,041
Int. Cl. D03d 27/00
U.S. Cl. 161—62 7 Claims

A sheet and pile projecting from the sheet, the pile being decorated to present a pictorial representation with the pile projecting in predetermined directions from the sheet and another pictorial representation when the pile projects in other predetermined directions from the sheet.

3,674,617
COSMETIC WIPE
William J. Mattes, Neenah, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.
Filed Dec. 11, 1969, Ser. No. 884,225
Int. Cl. B32b 5/12
U.S. Cl. 161—62 6 Claims

A cosmetic wipe comprising a top layer of high-loft, nonwoven fabric having a substantially continuous backing of flexible adhesive. The high-loft fabric includes a multiplicity of fibers individually looped outwardly from the backing layer, with the ends of each loop embedded

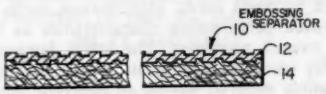


in the backing layer, and with the loops lined in substantially parallel planes. The adhesive backing is laminated to a base layer of fluid absorbent elastic foam material, such as polyurethane foam for example.

3,674,618
IMITATION SLIVER KNIT PILE FABRIC
Donald C. Spann, Greenville, S.C., assignor to Phillips Petroleum Company
Filed Nov. 16, 1970, Ser. No. 89,898
Int. Cl. B32b 5/06, 7/08; D04h 11/00
U.S. Cl. 161—64 9 Claims

A layer of nonwoven staple fibers is needle punched into a thermoplastic film. The fibers on one side of the film are thermally bonded to the film. The fibers on the opposite side of the film are then subjected to napping and shearing operations. The film is preferably an oriented polypropylene film which fibrillates during the needling operation. The fabric is useful as a lining in coats.

3,674,619
EMBOSSING SEPARATOR
Herbert I. Scher and Israel S. Ungar, Randallstown, Md., assignors to Esso Research and Engineering Company
Filed Oct. 13, 1969, Ser. No. 865,894
Int. Cl. B32b 3/00
U.S. Cl. 161—119 8 Claims

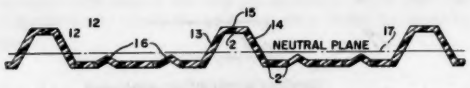


An embossing separator is made by impregnating a fibrous material, such as paper, with a solution of a crystalline material having a sharp melting point, and bonding the so-impregnated paper to a suitable release layer such as aluminum foil with a hot embossing roll. This separator is then used to impart a three dimensional surface sculpture to a decorative laminate during the curing cycle thereof.

3,674,620
REINFORCED PLASTIC PANEL AND METHOD OF MAKING THE SAME
Robert P. McCarthy, Overland Park, Kans., and Charles W. Matlock, Grandview, Mo., assignors to Butler Manufacturing Company, Kansas City, Mo.
Continuation of application Ser. No. 22,153, Mar. 24, 1970. This application May 25, 1970, Ser. No. 40,332
Int. Cl. B32b 3/28; B32h 17/28
U.S. Cl. 161—133 14 Claims

A corrugated panel having a neutral plane, continuous elongated longitudinally disposed spaced apart reinforc-

ing means positioned at least at the apices of the corrugations in said panel and spaced from the neutral plane



of the panel to impart maximum strength thereto, and the method of making such panel.

3,674,621

PROCESS OF MAKING A SHEET PAPER

Haruo Miyamoto, Hideho Uchida, and Masaru Uehara, Nagoya, Japan, assignors to Mitsubishi Rayon Company Limited, Tokyo, Japan

Filed Feb. 17, 1970, Ser. No. 12,074
Claims priority, application Japan, Feb. 25, 1969, 44/13,639, 44/13,640
Int. Cl. D21f *11/00*; D21h *5/12*
U.S. Cl. 162—146 24 Claims

A process of making a sheet paper in which an aqueous dispersion containing synthetic fiber, a hot water soluble fiber binder and carboxymethyl cellulose is prepared and subsequently, a sheet paper is formed from the aqueous dispersion. The aqueous dispersion may contain a fibrous material having a lower melting point than that of the synthetic fiber in addition to the above ingredients. A sheet paper from the latter aqueous dispersion is subjected to heat treatment.

3,674,622

NOVEL LAMINATING MEDIA

Paul A. Plasse, Lexington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed July 14, 1969, Ser. No. 841,258
Int. Cl. B32b *3/26, 5/18*; G09f *3/02*
U.S. Cl. 161—160 7 Claims

Novel laminating media especially useful in combination with data storage media to provide laminated articles such as credit cards, identification cards or the like of improved performance characteristics as well as improved overall aesthetics. The novel laminating media essentially comprise a substrate coated with a layer of a compressible material having an adherent capability.

3,674,623

SURFACE CRYSTALLIZED POLY(2,2,4,4 - TETRAMETHYLCYCLOBUTANEDIOL-1,3) CARBONATES

Walter D. Niegisch, Watchung, N.J., assignor to Union Carbide Corporation

No Drawing. Original application Dec. 26, 1967, Ser. No. 693,120, now Patent No. 3,541,200. Divided and this application Apr. 24, 1970, Ser. No. 31,739
Int. Cl. B29c *25/00*
U.S. Cl. 161—164 5 Claims

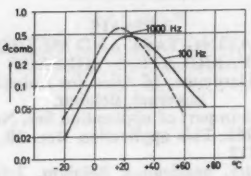
A shaped (transparent, non-oriented carbonate polymer containing the esterification residue of 2,2,4,4-tetramethylcyclobutanediol-1,3 wherein either the shaped article has a plurality of surfaces or a single surface, with the proviso that where the shaped article has a plurality of surfaces at least two surfaces thereof are crystalline and any portion of the article which is free of crystallinity is amorphous and that where the shaped article has a single surface the single surface is crystalline and any portion of the article which is free of crystallinity is amorphous, and which crystalline surfaces are resistant to attack by solvating organic liquids, such as conventional solvents for the amorphous polymer, and body oils, without adversely affecting its transparency.

3,674,624

VIBRATION DAMPED SANDWICH SYSTEMS HAVING INTERLAYERS OF VINYL ACETATE/2-ETHYLHEXYL ACRYLATE/DIBUTYL MALEATE/CROTONIC ACID COPOLYMERS

Hermann Oberst, Hofheim, Taunus, Joachim Ebigt and Gunther Duve, Frankfurt am Main, and Alfred Schommer, Bad Soden, Taunus, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

Continuation-in-part of application Ser. No. 684,739, Nov. 21, 1967. This application Dec. 14, 1970, Ser. No. 98,033
Claims priority, application Germany, Nov. 25, 1966, F 50,757
Int. Cl. B32b *15/08*; C08f *15/20*; E04b *1/86*
U.S. Cl. 161—165 4 Claims



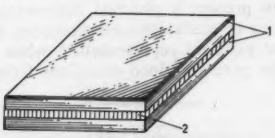
A vibration damped sandwich system comprising two hard plates and interposed between the plates a vibration damping interlayer comprising a copolymer of 30 to 40% by weight of vinyl acetate, 30 to 40% by weight of 2-ethyl-hexyl acrylate, 30 to 10% by weight of dibutyl maleate and 5 to 15% by weight of crotonic acid.

3,674,625

VIBRATION DAMPED SANDWICH SYSTEMS HAVING INTERLAYERS OF VINYL ACETATE/N-BUTYL ACRYLATE/DIBUTYL MALEATE/CROTONIC ACID COPOLYMERS

Hermann Oberst, Hofheim, Taunus, Joachim Ebigt and Gunther Duve, Frankfurt am Main, and Alfred Schommer, Bad Soden, Taunus, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

Continuation-in-part of abandoned application Ser. No. 684,740, Nov. 21, 1967. This application Dec. 14, 1970, Ser. No. 98,012
Claims priority, application Germany, Nov. 25, 1966, F 50,758
Int. Cl. B32b *15/08*; C08f *15/20*; E04b *1/86*
U.S. Cl. 161—165 4 Claims



A vibration damped sandwich system comprising two hard plates and interposed between the plates a vibration damping interlayer comprising a copolymer of 30 to 40% by weight of vinyl acetate, 30–40% by weight of n-butyl acrylate, 30 to 10% by weight of dibutyl maleate and 5 to 15% by weight of crotonic acid.

3,674,626

THERMO-FORMABLE PLASTIC MATERIAL FOR MAKING SEMI-RIGID PLASTIC PACKAGES

James I. Mergy, New London, Wis., assignor to Curwood, Inc.

Filed July 24, 1969, Ser. No. 844,572
Int. Cl. B32b *7/02, 27/30*
U.S. Cl. 161—165 6 Claims

A novel thermo-formable plastic material characterized by its ability to take shallow or deep draws and be substantially wrinkle free after being subjected to heat for the forming process, the material being a laminate of rigid plastic material with an oriented thermo-plastic material adhered thereto, whereby the shrink energy of the latter material is used to prevent wrinkle formation during the heating of the laminate preliminary to forming, and whereby after a product has been placed in the cup-shaped depression formed by the draw, a cover sheet may be sealed to the flanges thereof to produce a hermetically sealed package free of weak spots normally caused by wrinkling or buckling of the sheet. The invention also includes a novel method for making such packages.

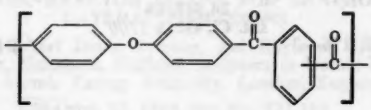
3,674,627

INSULATED ELECTRICAL CONDUCTOR

Rudolph John Angelo, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

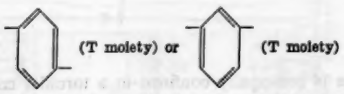
No Drawing. Filed June 10, 1970, Ser. No. 45,233
Int. Cl. H01b *7/00*
U.S. Cl. 161—175 5 Claims

An insulated electrical conductor is provided having an insulation wrapping of a crystalline copolyketone film structure having the following repeating structural unit



wherein the

moiety is either



and the T:I ratio varies from 90:10 to 50:50. A process is also provided whereby a copolyketone film structure having the above repeating structural unit is wrapped around an electrical conductor and thereafter subjected to two distinct heating steps to first seal the copolyketone wrapping covering and then to crystallize the copolyketone wrapping covering.

3,674,628

TUBULAR AND POROUS FIBRES

Albert Fabre, Lyon, France, assignor to Rhone-Poulenc S.A., Paris, France

No Drawing. Filed Oct. 27, 1969, Ser. No. 869,897
Claims priority, application France, Oct. 29, 1968, 171,845
Int. Cl. D01d *5/24*
U.S. Cl. 161—178 4 Claims

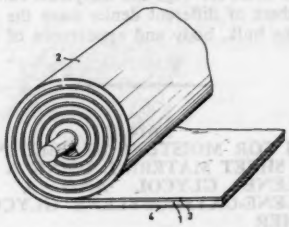
Tubular fibres suitable for use in ultrafiltration, reverse osmosis and for separation processes, containing a continuous axial channel and having a skin over a peripheral external or internal open microporous zone, are prepared by extruding a polymer solution through an annular spinnerette and coagulating one or both peripheral zones of the fibre.

3,674,629

THIN TAPE OR FOIL MADE OF AN ELECTRICALLY INSULATING SYNTHETIC MATERIAL

Jan Roos, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 7, 1969, Ser. No. 789,512
Claims priority, application Netherlands, Jan. 17, 1968, 6800694
Int. Cl. B32b *15/08;* H01b *13/00;* H01g *1/00*
U.S. Cl. 161—214 7 Claims



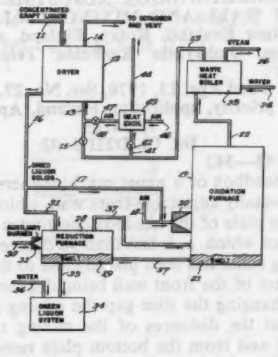
A thin tape of foil of an insulating material for wound capacitors having on one side a layer of metal and on the other side an insulating oxide of the metal.

3,674,630

KRAFT LIQUOR RECOVERY SYSTEM INCLUDING PHYSICALLY ISOLATED OXIDATION AND REDUCTION STAGES

George G. Copeland, Western Springs, Ill., assignor to Copeland Systems, Inc., Oak Brook, Ill.

Filed Nov. 14, 1969, Ser. No. 876,727
Int. Cl. D21c *11/12*
U.S. Cl. 162—30 8 Claims



Kraft black liquor is treated for recovery of its heat and chemical content by drying to produce solid material, burning the solid material in an oxidation furnace to

produce hot gases and a molten smelt containing the inorganic constituents. Heat is recovered from the hot gases by heat exchange, while the molten smelt is transferred to a separate reduction furnace, where chemical reduction is accomplished by reaction with carbon. The reduced smelt is then further regenerated for use by conventional means. The invention eliminates the explosion and odor problems associated with conventional recovery systems, at a lower equipment cost.

3,674,631
ARTIFICIAL HAIR
Milton H. Schwarz, Westport, Conn., and Marvin E. Goldberg, Monsey, N.Y., assignors to Revlon, Inc.
No Drawing. Filed Jan. 11, 1971, Ser. No. 105,654
Int. Cl. A41g *5/00*
U.S. Cl. 162—149 **6 Claims**

Artificial fibers for wigs and hairpieces comprising mixtures of fibers of different denier have the soft, natural feel and the bulk, body and appearance of natural hair.

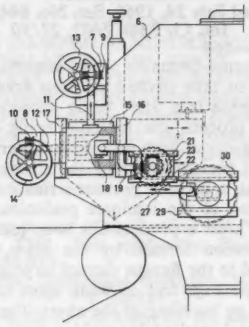
3,674,632
PROCESS FOR MOISTURE STABILIZING CELLULOSIC SHEET MATERIAL USING A POLYOXYALKYLENE GLYCOL AND A POLYOXYETHYLENE-OXYPROPYLENE GLYCOL BLOCK POLYMER
Johan Jakob Wennergren, Bagegatan 29, Ornskoldsvik, Sweden, and Lars-Gunnar Samuelsson, Satervagen 3, Alfredshem, Sweden
No Drawing. Filed Sept. 8, 1969, Ser. No. 856,201
Claims priority, application Sweden, Sept. 10, 1968, 12,172/68
Int. Cl. D21h *3/44*
U.S. Cl. 162—168 **12 Claims**

A moisture-stabilizing composition is provided for cellulosic sheet material, such as paper, comprising a polyoxyalkylene glycol as a moisture-stabilizer, and a polyoxyethylene-oxypropylene glycol block polymer, to enhance the rate of absorption of the polyoxyalkylene glycol in the sheet material. A process for moisture-stabilizing cellulosic sheet material also is provided, which comprises incorporating such a composition in the cellulosic material.

3,674,633
HEADBOX FOR A PAPER MACHINE PROVIDING FOR SIMULTANEOUS ADJUSTMENT OF THE FRONT WALL AND MIXING ROLL THEREIN
Osmo Rainer Evalahti, Kotka, Finland, assignor to A. Ahlstrom Osakeyhtio Karhulan Tehtaat, Karhula, Finland
Filed Apr. 13, 1970, Ser. No. 27,499
Claims priority, application Finland, Apr. 15, 1969, 1,094/69
Int. Cl. D21f *1/02*
U.S. Cl. 162—342 **7 Claims**

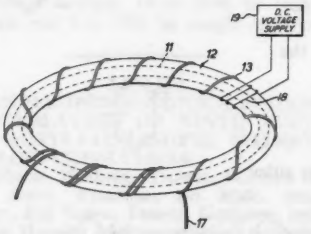
In the headbox of a paper machine there is a vertically and horizontally adjustable front wall, which together with the bottom plate of the headbox constitutes a slice portion, the angle of which, α, is less than 90 degrees, and in which the mixing roller has been placed close to the slice portion. In the event of the front wall being displaced for the purpose of changing the slice gap the mixing roller is so displaced that the distances of the mixing roller from the front wall and from the bottom plate remain unchanged.

The mixing roller has been arranged in the event of displacement of the adjustable front wall in the direction parallel to the bottom plate to be displaced parallel to the bottom plate through the same distance and the mixing roller has been arranged in the event of the adjustable front wall being displaced through the distance (a) in the



direction perpendicular to the bottom plate to be displaced parallel to the bottom plate through the distance $a/\tan \alpha$.

3,674,634
PLASMA CONFINEMENT APPARATUS
Christopher John Hamilton Watson, Merton College, Oxford, England, assignor to United Kingdom Atomic Energy Authority, London, England
Filed Jan. 21, 1969, Ser. No. 792,553
Claims priority, application Great Britain, May 22, 1968, 24,547/68
Int. Cl. G21b *1/00*
U.S. Cl. 176—3 **4 Claims**

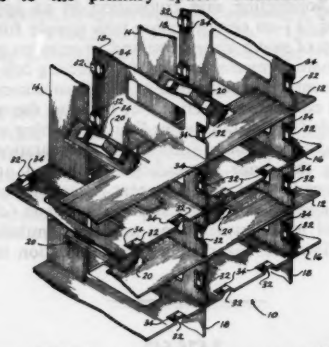


Plasma is principally confined in a toroidal configuration by a static magnetic field. For stabilising the plasma, a radiofrequency electromagnetic field moving faster than the ions in the plasma and of frequency in the region of 1 megahertz is applied. Power for generating the radiofrequency field is coupled into an endless path for conducting electromagnetic power, the path having a distributed inductance and capacitance such that it is a circuit which resonates at the frequency of the electromagnetic field.

3,674,635
BIMETALLIC SPACER GRID
Andrew J. Anthony, Tariffville, Albert L. Gaines, West Simsbury, and Donald M. Krawiec, Thompsonville, Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.
Filed Mar. 27, 1970, Ser. No. 23,231
Int. Cl. G21c *3/34*
U.S. Cl. 176—78 **5 Claims**

An improved bimetallic spacer grid arrangement for fuel element support in nuclear reactors. A plurality of

primary spacer elements are nested with a plurality of secondary spacer elements, the primary spacer elements extending less than one-half the full depth of the secondary spacer elements. Spring ferrules are positioned relative to the primary spacer elements at particular



locations within the spacer grid arrangement for retention therebetween. The primary and secondary spacer elements are formed from a first material having characteristic low neutron capture cross section while the spring ferrules are formed from a second material having better stress relaxation properties than the first material.

3,674,636

NUCLEAR REACTOR MEANS FOR MINIMIZING LATERAL VIBRATIONS

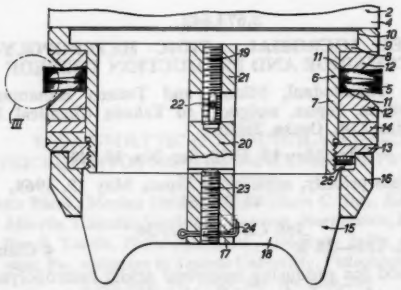
Philip Michael Jones, Preston, and Raymond Herbert Walsh, Blackpool, England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Oct. 28, 1968, Ser. No. 771,190

Claims priority, application Great Britain, Nov. 23, 1967, 53,447/67

Int. Cl. G21c *3/14*

U.S. Cl. 176—77 **5 Claims**



Lateral vibrations of a component when subjected to coolant flow in a channel of a nuclear reactor core structure during lifting and lowering of the component from and into the channel are minimised by the provision of radially projecting spring bristles at the lower end of the component, the bristles being of a length so as to locate the lower end of the component by engagement with the channel wall.

3,674,637

SPACER GRID FOR NUCLEAR REACTOR FUEL ELEMENT ASSEMBLY

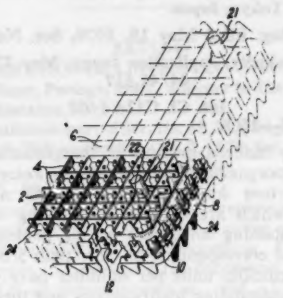
Jacques Delafosse, Gif-sur-Yvette, and Jean-Luc Viaud, Bures-sur-Yvette, France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed June 20, 1969, Ser. No. 835,117

Claims priority, application France, July 2, 1968, 157,536

Int. Cl. G21c *3/34*

U.S. Cl. 176—78 **4 Claims**



The invention concerns a spacer grid which maintains each rod of a nuclear reactor fuel elements assembly in a relatively large number of points and has however a low resistance to coolant flow.

This grid is formed by interassembled cut-out sheet metal members, each comprising two parallel rectilinear ribbon elements which delimits with narrow corrugated strips quadrangular openings, one of said ribbon being interrupted by a slot along the center line of each opening to permit insertion of another member.

3,674,638

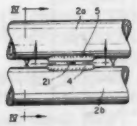
NUCLEAR REACTOR FUEL ELEMENT ASSEMBLY

John Cameron McGregor, Port Hope, Ontario, Canada, assignor to Atomic Energy of Canada Limited, Ottawa, Ontario, Canada

Filed Apr. 15, 1969, Ser. No. 816,271

Int. Cl. G21c *3/08, 3/34*

U.S. Cl. 176—81 **7 Claims**



A nuclear reactor fuel element assembly wherein a plurality of fuel elements are disposed side-by-side and are joined together at an intermediate position along their lengths by pairs of pads each one of a pair being brazed

to a fuel element cladding and joined to the other pad of that pair by a weld or braze having a weaker breaking strength than the fuel element claddings. Each pair of pads provides a robust joint between two fuel elements, which will break before rupture of a fuel element cladding occurs.

3,674,639

METHOD OF PRODUCING L-GLUTAMIC ACID BY FERMENTATION

Shigeho Ikeda, Tokyo, and Ayaaki Ishizaki, Yoshio Hirose, and Teruo Shiro, Kanagawa-ken, Japan, assignors to Ajinomoto Co., Inc., and Sanraku Ocean Co., Ltd., Tokyo, Japan

No Drawing. Filed May 18, 1970, Ser. No. 38,534

Claims priority, application Japan, May 27, 1969, 44/41,117

Int. Cl. C12d *1/00*

U.S. Cl. 195—28 R **9 Claims**

Artificially induced mutants of the glutamic acid producing microorganisms *Brevibacterium ketoglutamicum, Corynebacterium hydrocarboclastus,* and *Arthrobacter paraffineus* which are capable of growing on an agar medium containing substances having penicillin activity in an amount corresponding to more than 5 international or U.S.P. penicillin units per milliliter have been found capable of assimilating hydrocarbons and their oxidation products as the principal source of carbon from a nutrient medium containing penicillin-active substances in high concentrations, and to convert the assimilated material to L-glutamic acid relatively rapidly until concentrations of more than 7 g./dl. are reached in the medium.

3,674,640

CULTIVATION OF HYDROCARBON-CONSUMING YEASTS

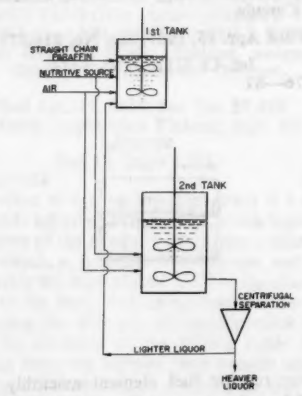
Isao Takeda, Ohi-machi, Iruma-gun, Takashi Iguchi, Tokyo, Katsuaki Tsuzuki, Nobeoka-shi, and Tooru Nakano, Tokyo, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jan. 14, 1970, Ser. No. 2,820

Claims priority, application Japan, Jan. 30, 1969, 44/6,293; Feb. 26, 1969, 44/13,946

Int. Cl. A23l *1/28*

U.S. Cl. 195—28 R **4 Claims**



Method for the cultivation of hydrocarbon-consuming yeasts by a continuous fermentation process which comprises (a) cultivating *Torulopsis petrophilum, Candida petrophilium* or *Brettanomyces petrophilum,* a species of yeast capable of consuming hydrocarbons as the carbon source in a medium containing a hydrocarbon fraction boiling at temperatures in a range of 200 to 360° C.; (b) aerobically conducting said cultivation in an apparatus consisting of (1) an emulsification tank mainly for forming emulsion of said hydrocarbon and an aqueous solution and (2) a main fermentation tank for effecting cell formation or fermentative production of useful substances, said tanks being connected in series; (c) using as the medium in said emulsification tank a medium containing said hydrocarbon at a high concentration, the fermentation waste liquor from the main fermentation tank and an alcohol at a concentration of 0.5 percent by volume or lower based on the entire volume of said medium; and (d) feeding into said main fermentation tank the emulsified fermentation liquor obtained in said emulsification tank.

3,674,641

PROCESS FOR PRODUCING 5'-PURINE NUCLEOTIDES

Katsunobu Tanaka, Machida-shi, Takashi Nara, Tokyo, Masanaru Misawa, Kawasaki-shi, and Toshio Komuro, Tokyo, Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

No Drawing. Continuation of application Ser. No. 536,317, Mar. 22, 1966. This application July 15, 1968, Ser. No. 744,641

Claims priority, application Japan, Mar. 31, 1965, 40/18,243

Int. Cl. C12d *13/06*

U.S. Cl. 195—28 N **12 Claims**

A process of producing 5'-purine nucleotides, such as 5'-inosinic acid, 5'-guanylic acid, 5'-adenylic acid and 5'-xanthylic acid, by fermentation. A microorganism, e.g., *Arthrobacter simplex* ATCC 15799, is cultured in an aqueous medium containing, as a carbon source, at least one hydrocarbon. The hydrocarbon is, for example, kerosene, paraffin, cycloparaffin, olefin, cycloolefin, benzene, a lower alkyl-substituted benzene, light oil or heavy oil.

3,674,642

NOVEL MICROBIAL ACIDIC HETEROPOLYSACCHARIDE AND PRODUCTION THEREOF

Saburo Yamatodani, Minoo, and Tsuneo Kanamaru, Toyonaka, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed May 19, 1970, Ser. No. 38,780

Claims priority, application Japan, May 19, 1969, 44/38,551

Int. Cl. C12d *13/04*

U.S. Cl. 195—28 R **4 Claims**

Method for producing microbial acidic heteropolysaccharide, of which the saccharide units consist substantially of glucose and mannose and the acid units consist substantialy of succinic acid, lactic acid and acetic acid, which comprises incubating *Corynebacterium equi* var. *mucilaginosus* in a culture medium containing hydrocarbon as the main carbon source together with digestible nitrogen source and other nutrients necessary for the growth of the microorganism until a substantial amount of the acidic heteropolysaccharide is accumulated in the culture broth, and recovering the accumulated acidic heteropolysaccharide therefrom.

3,674,643

PREPARATION OF PROTEOLYTIC ENZYMES HAVING MAXIMUM ACTIVITY AT HIGH ALKALINITY

Knud Aunstrup, Farum; Otto Andresen, Copenhagen, and Helle Outtrup, Vaerlose, all of Denmark, assignors to Novo Terapeutisk Laboratorium A/S, Copenhagen, Denmark

Filed Nov. 1, 1968, Ser. No. 772,830

Claims priority, application Great Britain, Nov. 10, 1967, 51,307/67

Int. Cl. C12d *11/00, 13/10*

U.S. Cl. 195—62 3 Claims

A method of making proteolytic enzyme preparations having maximum activity at high alkalinity by submerged aerobic cultivation of strains of *Bacillus alcalophilus* in a nutrient medium containing assimilable carbon and nitrogen sources, while maintaining the pH-value of the nutrient medium between 7.5 and 11.

3,674,644

PRODUCTION OF NOVEL ACIDSTABLE AND THERMOSTABLE PROTEASE

Tamotsu Yokotsuka, Nagareyama-shi; Hikotaka Hashimoto, Noda-shi, and Takashi Iwaasa, Noda-shi, all of Japan, assignors to Kikkoman Shoyu Co., Ltd., Noda-shi, Japan

Filed Dec. 12, 1969, Ser. No. 884,740

Claims priority, application Japan, Dec. 26, 1968, 43/95002; Oct. 7, 1969, 44/79624

Int. Cl. C12d *13/10*

U.S. Cl. 195—62 19 Claims

New acidstable and thermostable protease which is active at pH 1.5–6.5; an optimum pH being 2.0–3.0; an optimum temperature being 60° C. at pH 2.5, 75° C. at 3.5 and 75°–80° C. at 4.5.

The protease has a strong liquefaction power and makes free a very small amount of amino acids, e.g., amino state N: total N is less than 18, when a substrate of defatted soybean is decomposed.

The protease is useful for the food industry, fermentation industry and animal feed industry. The protease is produced by culturing *Penicillium duponti* ATCC 20186 in a solid or liquid medium at a temperature of, preferably, 40°–50° C. and at a pH of 4.0–7.0.

3,674,645

KERATINOLYTIC ENZYME ISOLATED FROM TRICHOPHYTON MENTAGORPHYTES AND PROCESS THEREFOR

Fritz Blank, Merion Station, Pa.; William C. Day, Edmonton, Alberta, Canada; Sandra R. Harmon, Norristown, Pa.; Pauline F. Toncic, Philadelphia, Pa., and Ruey J. Yu, Philadelphia, Pa., assignors to Temple University, Philadelphia, Pa.

Filed Aug. 14, 1969, Ser. No. 850,260

Int. Cl. C12d *13/10*

U.S. Cl. 195—66 R 5 Claims

Keratinase is produced by incubating *T. Mentagrophytes* for several days in growth medium, at a pH of 6–9, containing animal hair, magnesium salt, thiamine, pyridoxine and inositol. Preferably, glucose is also included and the pH is about 7.8. This keratinase is separated by filtering the growth media, partially purifying the enzyme by contact with diethylaminoethyl cellulose and adsorbing the keratinase on carboxymethyl cellulose. The crude keratinase is eluted from the cellulose and purified by molecular sieves, ion exchange resins or other means.

3,674,646

METHOD FOR MANUFACTURING PROTEASE

Isamu Tani, Tokushima-shi; Masatomi Otsuka, Naruto-shi; Yoshiyasu Osaki, Tokushima-ken, and Takuo Hagino, Naruto-shi, all of Japan, assignors to Otsuka Kagaku Yakuhin Kabushiki Kaisha, Osaka-shi, Japan

Filed Oct. 22, 1969, Ser. No. 868,613

Int. Cl. C12d *13/10*

U.S. Cl. 195—66 4 Claims

A method for manufacturing protease which comprises culturing Bacillus sp. 0–20 belonging to the genus Bacillus in a culture medium to produce protease and collecting the protease from the medium.

3,674,647

PREPARATION OF LINCOMYCIN ANALOGUES

Jeronimo Visser, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 68,002, Aug. 28, 1970, abandoned. This application Oct. 7, 1970, Ser. No. 78,935

Int. Cl. C12d *9/00*

U.S. Cl. 195—80 R 9 Claims.

Microbiological processes for preparing lincomycin analogues selected from the group consisting of 4′(S)-lincomycin, 4′-depropyl-4′-alkylidenelincomycin, 4′-depropyl-4′-alkyllincomycin, 1′-demethyl-4′(S)-lincomycin, 1′-demethyl-4′-depropyl-4′-alkylidenelincomycin and 1′-demethyl-4′-depropyl-4′-alkyllincomycin. These compounds have antibacterial properties and, accordingly, can be used in various environments to control the growth of susceptible micro-organisms.

3,674,648

BACTERIAL LAMP

Giorgio Soli, China Lake, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Filed Feb. 1, 1971, Ser. No. 111,507

Int. Cl. C12b *1/00*

U.S. Cl. 195—127 4 Claims

A bacterial lamp which produces a blue-green light which is particularly useful to divers to illuminate the immediate environment around them. The lamp comprises two vessels connected by valve means. One vessel is substantially filled with a bacteria culture medium and the other with a suspension of luminous bacteria in a non-nutrient medium. An oxygen bottle is connected by suitable means to the vessel containing the bacterial suspension and in operation gas pressure forces a predetermined amount of the bacterial suspension into the vessel containing the nutrient medium, whereupon the bacteria start to grow and a light output of considerable intensity is produced.

3,674,649

METHOD FOR THE PRODUCTION OF HUMIC ACIDS, HUMATES, AND OF COMPOSITIONS WHEREIN THEY ARE CONTAINED

Mario Formisano, Portici, (Napoli), and Salvatore Coppola, Napoli, both of Italy, assignors to I.C.B.S.P.A. Industria Chimica e Biologica, Napoli, Italy

Filed May 19, 1969, Ser. No. 825,944

Claims priority, application Italy, May 18, 1968, 31329 A/68

Int. Cl. C12b *1/00*

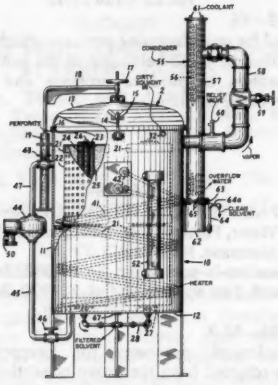
U.S. Cl. 195—104 19 Claims

Process for the preparation of humic acids and salts thereof by successive steps of fermentation of garbage and agricultural byproducts, under selected, controlled, temperature, time, and aeration conditions.

3,674,650
LIQUID PURIFYING SYSTEM

Max M. Fine, 135-17 Jewell Avenue, Kew Garden Hills, N.Y.

Filed March 18, 1970, Ser. No. 20,751
Int. Cl. B01d *3/00*, ; F28b ; C02c ; B01d *23/00*; C02b
U.S. Cl. 202—176 8 Claims

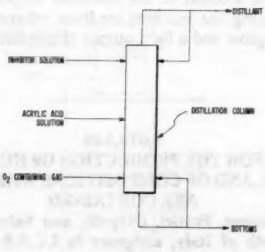


A liquid-purifying system particularly for purifying the solvent used in a dry-cleaning machine comprises a combined filter and still. Filter cartridges are arranged in a closed vessel which also is provided with a heating coil for vaporizing liquid in the vessel. The level of liquid in the vessel is automatically controlled during distillation operation to provide a vapor space above the liquid. A condenser connected with the vapor space condenses the vapor produced by vaporization of the liquid and also separates any water that may be present.

3,674,651
POLYMERIZATION INHIBITION OF ACRYLIC ACID

Susumu Otsuki; Kyoichi Hori, and Isao Miyanohara, all of 4560, Oaza-Tonda, Nanyo-cho, Tsuno-gun, Yamaguchi, Japan

Filed June 10, 1970, Ser. No. 45,213
Claims priority, application Japan, June 10, 1969, 44/45613; June 24, 1969, 44/49888
Int. Cl. C07c *57/04*; B01d *3/34*
U.S. Cl. 203—8 11 Claims

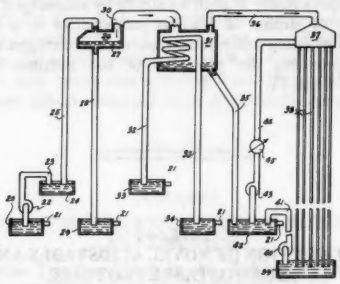


The inhibition of the polymerization of acrylic acid and a process for stabilizing the distillation of acrylic acid using a combination of a polymerization inhibitor, such as diphenylamine or its derivatives, and an oxygen-containing gas, or mixtures of polymerization inhibitors, such as diphenylamine or its derivatives, with benzoquinone and/or hydroquinone mono-methyl-ether, and an oxygen-containing gas are disclosed.

3,674,652
METHOD OF WATER PURIFICATION

Melvin Henry Brown, Leechburg, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 571,514, Aug. 10, 1966. This application Aug. 14, 1969, Ser. No. 850,160. The portion of the term of this patent subsequent to Sept. 15, 1987, has been disclaimed.
Int. Cl. B01d *3/00*
U.S. Cl. 203—11 5 Claims

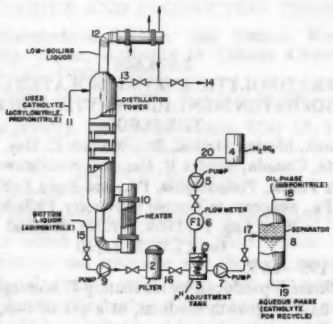


Method of purifying water, such as sea water, by low temperature evaporation thereof under conditions of reduced pressure to produce a gaseous mixture of water vapor and non-condensible gas and, subsequent to substantial condensation of the water vapor, encapsulation of the remaining uncondensed water vapor and the non-condensible gases in a downwardly flowing vertical column of foamed encapsulating liquid.

3,674,653
METHOD OF THE PURIFICATION OF CATHOLYTES

Maomi Seko, Tokyo; Shinsaku Ogawa, Nobeoka; Ryozo Komori, Nobeoka; Masaro Asuma, Nobeoka; Toshiro Isoya, Nobeoka, and Takamasa Sakai, Nobeoka, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed April 22, 1970, Ser. No. 30,853
Claims priority, application Japan, May 1, 1969, 44/33244
Int. Cl. B01d *3/34*
U.S. Cl. 203—34 6 Claims



A method of the purification of a catholyte in the electrolytic hydrodimerization of acrylonitrile for the production of adiponitrile which comprises subjecting acrylonitrile and low-boiling byproducts such as propionitrile contained in the catholyte to distillation to remove the same, then adjusting the

pH of the aqueous phase in the remaining emulsified liquor to 3.0 or below to distribute the major portion of carboxylates contained in the aqueous phase into the oil phase mainly consisting of adiponitrile, and eliminating the carboxylates out of the system through the medium of the oil phase to effect reduction of the carboxylate concentration in the catholyte.

3,674,654

DETERMINATION OF OXYGEN IN MOLTEN STEEL

Paul Louis Jackson, Dearborn, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 11, 1970, Ser. No. 97,350

Int. Cl. G01n *27/46*

U.S. Cl. 204—1 T **5 Claims**

This invention is concerned with a process of very accurately and rapidly measuring the oxygen content of molten steel as the steel is being processed. This invention is dependent for its viability upon the use of a solid electrolyte comprising stabilized zirconia and beryllia reacted at a high temperature to form such solid electrolyte. Controlled porosity of the solid electrolyte forms a part of this invention.

3,674,655

SURFACE PREPARATION OF URANIUM PARTS

Louis de Vaulchier du Deschaux, Paris; Alain de Fouchier, Bourg-La-Reine; Emmanuel de Vaucelles, Paris, and Louis Facquet, Vaucresson, all of France, assignors to Commissariat A L'Energie Atomique, Paris, France

Filed Jan. 13, 1969, Ser. No. 790,869

Claims priority, application France, Jan. 24, 1968, 68137312

Int. Cl. B01k *3/12*

U.S. Cl. 204—1.5 **8 Claims**

Prior to electroplating parts of uranium or uranium base alloys, the parts are subjected to a surface preparation which comprises preliminary steps of chemical degreasing, electrolytic degreasing and if necessary of chemical etching and further comprises an anodic electrolytic treatment in an aqueous solution of an organic salt or a sulphate of lithium and/or magnesium.

3,674,656

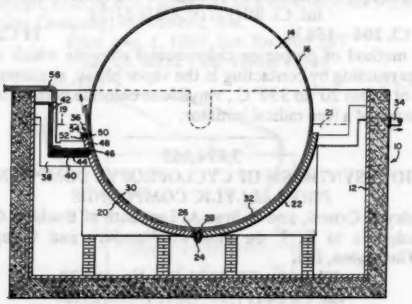
BONDING TREATMENT AND PRODUCTS PRODUCED THEREBY

Charles B. Yates, Willingboro, N.J., assignor to Circuit Foil Corporation, Bordentown, N.J.

Filed June 19, 1969, Ser. No. 839,777

Int. Cl. C23b *7/02, 5/48, 5/58*

U.S. Cl. 204—13 **18 Claims**



A method of producing metal foil having enhanced bond strength comprising forming said metal foil in a body of electrolyte at a first cathode current density and forming a non-powdery series of spaced projections on said foil by making the latter while subjecting it in said body of electrolyte to a cathode current density significantly in excess of the former current density. Apparatus for producing metal foil having the characteristics described. Metal foil having the characteristics described. A laminate including a substrate bonded to said metal foil and having the characteristics described.

3,674,657

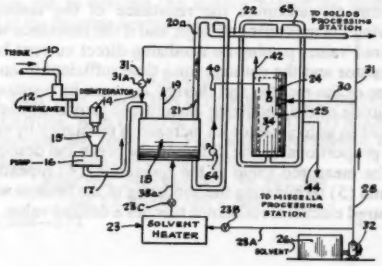
METHOD OF PRODUCING FAT AND EDIBLE SOLIDS FROM BIOLOGICAL MATERIAL USING VAPOR HEATED SOLVENT

Ezra Levin, Champaign, Ill., assignor to VioBin Corporation, Champaign, Ill.

Division of Ser. No. 640,523, May 23, 1967, Pat. No. 3,509,933, which is a continuation-in-part of Ser. No. 408,231, Nov. 2, 1964, Pat. No. 3,538,973. This application April 8, 1970, Ser. No. 26,632

Int. Cl. B01d *1/14, 1/00*; F26b *7/100*; B01d *3/34*; A23b *1/04, 3/04*; C09f *5/00*

U.S. Cl. 203—49 **4 Claims**



An improved method of processing nutritious biological material for obtaining fat and a dehydrated and defatted solids residue of palatable nutritious character, using a fat solvent which forms with water from the biological material an azeotrope having a boiling temperature materially lower than that of the solvent itself. Heating of a slurry of solvent and biological material is effected by introducing hot solvent vapor into the slurry below its upper surface so that the incoming vapor is condensed and captured in the slurry which is kept well below the condensation temperature of the solvent vapor by the evaporation from the slurry of azeotrope at the lower boiling temperature of the latter. In condensing and cooling the incoming vapor, the slurry gains heat and boils at the boiling temperature of the azeotrope to distill off azeotrope with attendant defatting and dehydration of the biological material, obviating the input of heat through heat transfer surfaces and the caking of solids on such surfaces.

3,674,658

FILLERS FOR METALLIZED POLYAMIDES

Pieter J. van Asperen, Geleen, and Jozef L. M. van der Loos, Sittard, both of Netherlands, assignors to Stamicarbon N.V., Heerlen, Netherlands

Filed June 3, 1970, Ser. No. 43,184

Claims priority, application Netherlands, June 3, 1969, 6908381

Int. Cl. C23g *5/60*; C08g *20/00*; B44d *1/52*

U.S. Cl. 204—30 **4 Claims**

Objects composed of a metal-coated polyamide plastic, and a process for making same are disclosed in which a polyamide plastic substrate material is made by the hydrolytic polymerization of an omego lactam carried out at a temperature at least at the melting point of the polyamide material in the presence of one or more compounds soluble in the molten lactams, such as polyethers, alcohols of fatty acids having a

boiling point above the lactam, organic sulphones, alkali metal halides, paraffins and silicone oils. After appropriate surface treatment of this plastic material, metal coating is deposited by precipitation and by further treatment as by electro deposition, to obtain the metal-coated polyamide plastic object.

3,674,659

THIN-FILM RESISTOR ANODIZATION

Frederick C. Livermore, Hazeldean, and Graham Albert Neathway, Ottawa, Ontario, both of Canada, assignors to Northern Electric Company Limited, Montreal, Quebec, Canada

Filed Aug. 17, 1970, Ser. No. 64,446
Int. Cl. C23b 9/00; B01k 3/00
U.S. Cl. 204—56 R **1 Claim**

A method for adjusting the electrical resistance of thin-film metallic resistors by anodization is disclosed. The method includes the steps of: (1) supplying an electrolyte between a thin-film resistor and a cathode spaced therefrom; (2) applying a measuring voltage across the resistor for a period of time sufficient to determine the resistance of the resistor; (3) removing the measuring voltage, and if the resistance is below a desired value, passing an anodizing direct current between the resistor and the cathode for a time sufficient to anodize a surface of the resistor and thereby increase its resistance, the magnitude of the anodizing current and period of time being selected so as to produce an increase in resistance by an increment proportional to the difference between the desired value and the measured value of the resistance; (4) repeating step (2); and (5) terminating the anodizing of the resistor when the measured electrical resistance reaches a desired value.

3,674,660

ELECTRODEPOSITION OF COPPER

Derek Martin Lyde, Stourbridge, England, assignor to Albright & Wilson Limited, Oldbury near Birmingham, England

Continuation-in-part of Ser. No. 724,225, April 25, 1968. This application Aug. 14, 1970, Ser. No. 63,954
Claims priority, application Great Britain, May 1, 1967, 19,989/67
Int. Cl. C23b 5/18, 5/46
U.S. Cl. 204—52 R **13 Claims**

A copper pyrophosphate electroplating bath contains a known heterocyclic additive in conjunction with an auxiliary brightener selected from iminodiacetic acid, cinammic acid, aliphatic acid, di- and poly- carboxylic acids having at least seven carbon atoms, salts of the aforesaid acids and hydroxyethylcellulose. The auxiliary brightener prevents step plating which is normally caused by the presence of the heterocyclic brightener.

3,674,661

ELECTROCHEMICAL PRODUCTION OF NICKEL (I) COMPLEXES

William B. Hughes, Bartlesville, Okla., assignor to Phillips Petroleum Company

Filed March 1, 1971, Ser. No. 119,942
Int. Cl. C07b 29/06; C07f 9/02, 15/04
U.S. Cl. 204—73 R **8 Claims**

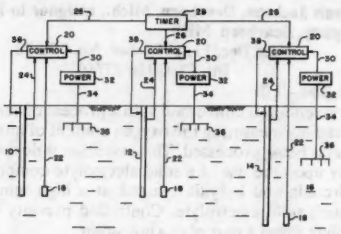
The treatment of nickel(II) halide compounds by controlled potential electrolysis is disclosed for the production of nickel(I) halide phosphine compounds.

3,674,662

CATHODIC PROTECTION OF CLOSELY SPACED OIL WELL CASINGS

Ernest W. Haycock, El Cerrito, Calif., assignor to Shell Oil Company, New York, N.Y.

Filed Nov. 10, 1970, Ser. No. 91,340
Int. Cl. C23f 13/00
U.S. Cl. 204—147 **3 Claims**



A method of cathodically protecting a plurality of closely spaced oil well casings by maintaining the casings at a predetermined negative potential with short current pulses and so timing said pulses that they do not overlap and thereby create mutual interference.

3,674,663

PHOTOCHEMICAL PROCESS FOR PREPARING A BICYCLIC LACTONE

John B. Siddall, Palo Alto, Calif., assignor to Zoecon Corporation, Palo Alto, Calif.

Filed Nov. 28, 1969, Ser. No. 880,966
Int. Cl. B01j 1/10
U.S. Cl. 204—158 R **4 Claims**

Synthesis of cis 2-(1′-methyl-2′-isopropenylcyclobutyl)ethanol, a component of the boll weevil sex attractant, and intermediates therefor, in which 5-hydroxy-pent-2-ynoic acid or ethers thereof is methylated followed by cyclization to yield 3-methylpent-2-eno-5-lactone which is irradiated in presence of ethylene to yield 2,3-cycloethylene-3-methylpentano-5-lactone which is cleaved and converted into 2-(1′-methyl-2′-isopropenylcyclobutyl)ethanol.

3,674,664

METHOD OF PREPARING CHLOROACETYL CHLORIDE

Eric R. Larsen, Midland, Mich.; Albert Kent Keller, Punta Gorda, British Honduras, and Raymond A. Plepys, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 804,689, March 5, 1969, abandoned. This application March 6, 1970, Ser. No. 17,292
Int. Cl. B01j 1/10; C07c 51/58
U.S. Cl. 204—158 R **11 Claims**

A method of preparing chloroacetyl chloride which comprises reacting by contacting in the vapor phase, at a temperature of about 20° to 350° C., vinylidene chloride with O_2 in the presence of a free radical initiator.

3,674,665

PHOTOSYNTHESIS OF CYCLOPROPYL COMPOUNDS FROM ALLYLIC COMPOUNDS

Stanley J. Cristol, and George A. Lee, both of Boulder, Colo., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

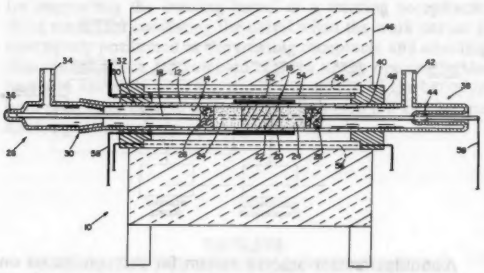
Filed May 28, 1970, Ser. No. 41,539
Int. Cl. B01j 1/10; C07c 17/00, 23/04
U.S. Cl. 204—163 R **16 Claims**

Disclosed is a novel photochemical process for rearranging a variety of allyl compounds to isomeric cyclopropyl compounds, e.g., crotyl chloride to cis- and trans-1-methyl-2-chlorocyclopropane.

3,674,666
ENHANCING REACTION RATES

Richard N. Foster, Boston, Mass., and John B. Butt, Wilmet, Ill., assignors to said Foster, by said Butt

Filed Aug. 19, 1970, Ser. No. 64,998
Int. Cl. B01k 1/00
U.S. Cl. 204—164 10 Claims

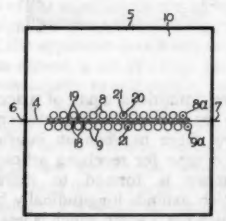


Process and apparatus for effecting a chemical reaction in an electrically uncharged reactant to produce a product by introducing reactant into a chemical reactor having walls defining a chamber, a reaction zone within the chamber, and an inlet to admit reactant to the chamber, a first electrode and a second electrode spaced therefrom, the electrodes being opposed across the reaction zone, a supporting structure of electrically non-conductive material supported between the electrodes and in the reaction zone, the structure having channels for passage of reactant and product material, a plurality of electrically conductive particles separately supported on the structure, the particles being electrically insulated one from another and having surface portions exposed to direct contact with reactant in the channels, the surface portions having catalytic effect which is enhanced by changing the electric charge on the surface portions, and means connected to the electrodes for establishing an electrical potential difference between said electrodes. Reactant is brought into contact with said surface portions of said particles while simultaneously applying an electric potential difference across the electrodes to produce an electric field which changes the charge on said exposed surface portions of the electrically conductive particles and thereby enhances the catalytic effect of said exposed surface portions in producing the product.

3,674,667
PROCESS FOR INCREASING WATER REPELLENCY OF COTTON CLOTH

Jean P. Manion, Milwaukee, and Daniel J. Davies, Mukwonago, both of Wis., assignors to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

Filed Aug. 1, 1969, Ser. No. 846,767
Int. Cl. B01k 1/00; D06m 13/08
U.S. Cl. 204—165 3 Claims

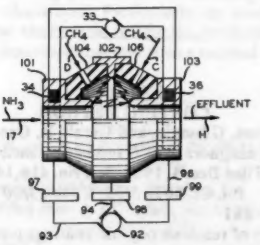


A manufactured material and a process for making the material is disclosed. The manufactured material is a hydrogen containing substance having a fluorinated surface and in which hydrogen atoms, which may be present in hydroxyl radicals attached to a carbon atom chain, have been replaced in the surface of the material by fluorine atoms or radicals, and with such fluorinated surface of the material containing at least about 2 micrograms of such fluorine per cm^2 of surface area. The process for making such a material includes the steps of selecting a substrate containing hydrogen atoms which may be present in hydroxyl radicals attached to a carbon atom chain, selecting a gas containing fluorine atoms or radicals, placing the selected substrate between electrodes in a flowing atmosphere of the selected gas at subatmospheric pressure, and subjecting the substrate to an electrodeless discharge of at least about 0.2 KWH/$yard^3$ to chemically activate both the surface of the substrate and the gas, and exchange the fluorine atoms or radicals for surface hydrogen atoms or radicals to produce a material with a surface, which compared to the substrate before this process treatment, is more water repellent (without sealing pores), is more corrosion and soil resistant, more chemically inert, and more like the relatively expensive polytetrafluoro-ethylene. When the substrate is a material having a relatively inert surface, such as polyethylene, the process is disclosed as including an initial treatment step that involves ion bombardment of the substrate in helium gas to activate the surface before the surface is treated in the fluorine containing gas.

3,674,668
ELECTRIC ARC PROCESS FOR MAKING HYDROGEN CYANIDE, ACETYLENE AND ACRYLONITRILE

Geir Bjornson, and Homer M. Fox, both of Bartlesville, Okla., assignors to Philips Petroleum Company

Filed Feb. 24, 1969, Ser. No. 801,364
Int. Cl. B01k 1/00; C22d 7/08
U.S. Cl. 204—171 6 Claims



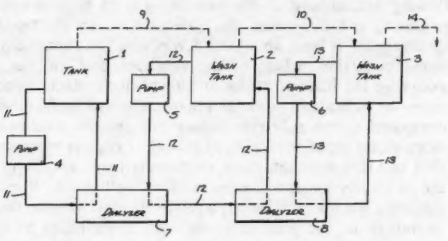
A lower hydrocarbon having from one to eight carbon atoms is passed through an electric arc, heated therein above about 1,000° F., and immediately mixed with nitrogen or a nitrogen-containing compound, which mixture immediately reacts to form acetylene, hydrogen cyanide and other products, which products are quenched below about 1,000° F. If desired, the resulting products are further reacted to form acrylonitrile from the further reaction of the acetylene with the hydrogen cyanide present. By not passing the nitrogen-containing compound through the arc during the process, severe errosion of the electrodes is avoided. By passing only the lower hydrocarbon through the arc during the process, it is not necessary to employ any inert arc gas, which would increase the cost of operation and the difficulty of separation of products. Because of lower cost and availability, methane and ammonia are preferred as the two reactants. Nitrogen and other nitrogen-containing compounds are disclosed as suitable nitrogen sources to replace the ammonia.

Apparatus features are the combination of a rotating arc heater with a fluidized bed arc effluent quench and feed preheater and, if desired, fluidized bed acrylonitrile from hydrogen and acetylene reactor followed, if desired, by a suitable series of fractionators.

3,674,669
CONCENTRATION OF ELECTROLYTE FROM DILUTE WASHINGS BY ELECTRODIALYSIS IN A CLOSED SYSTEM

Sidney B. Tuwiner, Baldwin, N.Y., assignor to RAI Research Corporation, Long Island City, N.Y.

Filed April 1, 1970, Ser. No. 24,602
Int. Cl. B01d 13/02
U.S. Cl. 204—180 P 13 Claims



Work from electroplating or metal finishing is washed by immersion in a series of solutions. The dragout of electrolyte which remains in the wash solutions is balanced by the transfer of electrolyte from each wash solution to a previous solution of the sequence or to a solution of the original bath concentration. This transfer of electrolyte is by electrodialysis in which a circulating stream of each wash solution acts as a diluting stream in relation to a circulating stream of a previous solution and as a concentrating stream in relation to a subsequent solution.

Extremely high ratios of concentration are achieved between wash stages by operation of the electrodialysis stack under conditions of membrane polarization.

3,674,670
COATING METHOD

J. Alden Erikson, Gibsonia, and Gerald R. Gacesa, Tarentum, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 4, 1964, Ser. No. 416,140
Int. Cl. B01k 5/02; C23b 13/00
U.S. Cl. 204—181 23 Claims

Application of resinous organic coatings onto non-conductive surfaces by electrodeposition is accomplished by first applying on the surface a layer of conductive particles in a carrier and then employing the surface as an electrode in an electrodeposition coating process to deposit a resinous coating on the surface. Carbon or metal particles can be used in the conductive layer and any electrodepositable resinous film-forming coating composition can be utilized in the process.

3,674,671
ELECTRODEPOSITION METHOD AND PRODUCT

Sanford E. Stromberg, Tonawanda, N.Y., assignor to Textron, Inc.

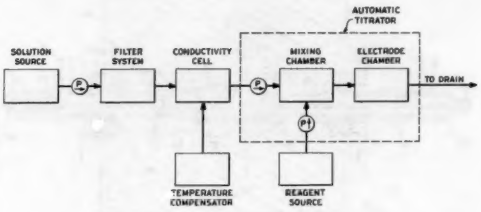
Filed Feb. 26, 1969, Ser. No. 802,633
Int. Cl. B01k 5/02; C23b 13/00
U.S. Cl. 204—181 9 Claims

Black iron oxide-containing coatings when deposited on solid substrates and cured exhibit sufficient electrical conductivity to permit application of a topcoat by electrodeposition. The black iron oxide-containing coatings can be formed on electrically conductive, solid substrates by electrodeposition. The coatings exhibit outstanding properties.

3,674,672
MULTIPARAMETER PROCESS SOLUTION ANALYZER-CONTROLLER

George Whitesell, Northville, Mich., assignor to Hooker Chemical Corporation, Niagara Falls, N.Y.

Filed March 25, 1970, Ser. No. 22,652
Int. Cl. G01n 27/46
U.S. Cl. 204—195 R 16 Claims

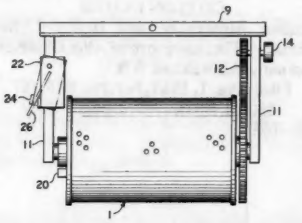


A multiparameter analysis system for the continuous on-stream real-time measurement, surveillance and correction of a process solution. Electrometric methods are employed to measure conductivity and ion concentration of the process solution. An accurate measurement of actual ion concentration is made by continuous automatic titration of a sample of the process solution. This electrometric analysis produces a signal reflecting the results of said analysis that is fed to controller-analyzer means which generate error signals when said solution deviates from a preselected state, which error signal controls means to automatically restore the process solution to the preselected state. The electrometric analysis means are protected by an automatically self-cleaning filter, the cleaning cycle of which is controlled in response to sensed system dynamics. While this system has particular utility in the analysis and control of nitrite in the surface conversion coating of ferriferous metallic objects, it possesses broad spectrum analytical capability including control of pollutants discharged into surface waters and for the quality control of surface waters.

3,674,673
APPARATUS FOR ELECTROPLATING WORKPIECES

Richard J. Jessup, Bloomfield Hills, Mich., assignor to Udylite Corporation, Warren, Mich.

Filed Feb. 9, 1970, Ser. No. 9,777
Int. Cl. C23b 5/78
U.S. Cl. 204—213 13 Claims



A treating barrel comprising a pair of spaced end members, a perforate body member extending between said end members and defining there between an internal, substantially cylindrical shaped zone for receiving articles to be treated. The body member is formed to define an opening therethrough which extends longitudinally between the end members and which has a width which is less than about one-sixteenth of the circumference of the cylindrically shaped zone. At least one tumbling rib, which extends along the in-

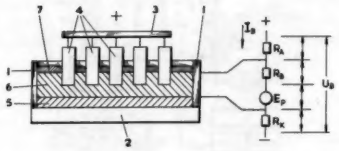
terior surface of the body member between the end members is disposed substantially dimetrically opposite to the opening, the tumbling rib projecting radially inwardly of the interior surface of the body member into the zone and being designed to impart a cascading action to the articles in the barrel during oscillatory motion thereof. Means are provided on the end member for supporting the barrel for oscillatory movement about an axis which extends substantially longitudinally of the zone. The overall apparatus assembly includes a work carrier for supporting the treating barrel at a treating receptiacle, drive means for oscillating the barrel when the work carrier is operatively positioned at the treating receptacle and coacting stop means which are oriented relative to the opening in the barrel to normally limit the rotary movement of the barrel in both directions beyond an angularity at which the articles are discharged through the opening of the barrel.

3,674,674

APPARATUS FOR CONTROLLING ELECTRODE ADJUSTMENT DURING ALUMINUM OXIDE REDUCTION

Mathieu Gerardus Henricus Arts; Jan Anna Antonius Lucker, both of Delfzijl, and Maarten Groenenboom, Escharen, all of Netherlands, assignors to Aluminium Delfzijl N.V., The Hague, Netherlands

Filed Dec. 22, 1969, Ser. No. 887,299
Claims priority, application Netherlands, Dec. 27, 1968, 6818752
Int. Cl. B01k *3/00*; C22d *3/02, 3/22*
U.S. Cl. 204—225 **4 Claims**



An apparatus for controlling the electrolytic reduction of aluminum oxide by adjusting the depth of immersion of anode blocks suspended on an anode bridge in an electrolysis melt containing Al_2O_3, said apparatus being of the type comprising an electric voltage supply for generating a reference voltage which is proportionate with the momentary bath current, an adjusting device for the anode bridge, which adjusting device is controlled by the difference in voltage over the bath and the reference voltage, and a system for deriving, according to a chosen program, a command signal for the adjusting device from the aforementioned differential voltage and the periodic, short excitation of the adjusting device by means of this possible command signal, said apparatus characterized by the improvement that the apparatus comprises an integrator having an input and an output, a set of relays each preceded by a trigger circuit connectable to said output, and means for feeding the differential voltage of the bath voltage and the reference voltage to the integrator and for disconnecting the integrator from the set of relays in the non-excited condition of the adjusting device, and for disconnecting the feeding of said differential voltage to said integrator and connecting said integrator to said set of relays in the excited condition of the adjusting device, and means for feeding back to the input of the integrator the integrated signal from said output when the differential voltage is fed to said integrator.

3,674,675

PLATINIZED PLASTIC ELECTRODES

Frank H. Leaman, 1613 N. Harrison Street, York, Pa.

Filed July 9, 1970, Ser. No. 53,638
Int. Cl. B01r *3/04*; C23b *5/60*
U.S. Cl. 204—290 R **4 Claims**

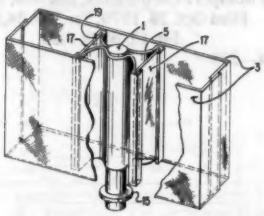
A platinum coated electrode is provided with a platinum layer applied directly over a relative inert material such as polysulfone or materials similar thereto. This electrode can be advantageously used for plating metals from corrosive solutions and for other applications wherein a platinum inert electrode would be used.

3,674,676

EXPANDABLE ELECTRODES

Edward I. Fogelman, Mentor, Ohio, assignor to Diamond Shamrock Corporation, Cleveland, Ohio

Filed Feb. 26, 1970, Ser. No. 14,333
Int. Cl. B01k *3/04*
U.S. Cl. 204—286 **10 Claims**



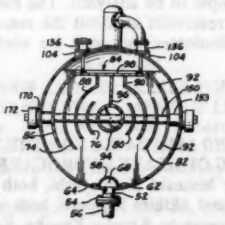
An electrode is provided which, after insertion in an electrolytic cell, may be caused to expand thereby reducing the electrode-electrode gap and, hence, increasing the power efficiency of the electrolysis. Particularly, an anode for use in a diaphragm-type electrolytic cell for the production of chlorine and caustic is described together with a method for assembling the cell.

3,674,677

ELECTRICALLY ENERGIZED PETROLEUM DE-EMULSIFIER

Robert J. Roberts, 9833 Moyers, Houston, Tex.

Filed June 2, 1970, Ser. No. 42,624
Int. Cl. B03c *5/02*
U.S. Cl. 204—302 **12 Claims**



An electrically energized deemulsifier for separating the constituents of water-petroleum emulsions and the like includes an elongated generally horizontally disposed vessel having an emulsion inlet at one extremity and having a clean fluid discharge at the other extremity thereof. A drain is disposed at the lower portion of the vessel for draining separated fluid such as water.

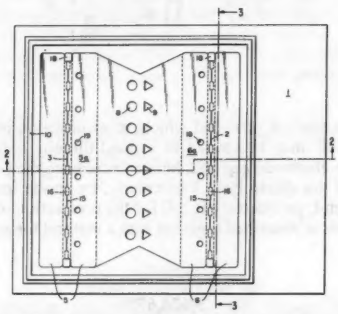
Inflowing emulsion is distorted and deflected downwardly by a scrubber plate that is provided with a plurality of apertures adjacent the lower end thereof that evenly distribute the flow of emulsion and prevent channeling. As the incoming emulsion is turned downwardly by the scrubber plate, free droplets of water will gravitate to the bottom of the vessel. Coalescence of the emulsion is effected as the emulsion flows evenly in a horizontal direction through an electric field developed between spaced high voltage and ground electrodes within the vessel. The high voltage electrode is positively supported during transportation of the vessel and is adjustable to any desired position within the vessel by manipulation of external adjustments. Flashing of volatile products within the vessel is effectively prevented since the unique design of the vessel eliminates any vapor pockets that would present a flash hazard.

3,674,678

ELECTROPHORETIC APPARATUS

Arthur H. Post, Jr., Belmont, Mass.; Ronald L. Polinsky, Hanover, N.H., and James L. Dwyer, Concord, Mass., assignors to Millipore Corporation, Bedford, Mass.

Filed Oct. 28, 1970, Ser. No. 84,587
Int. Cl. B01k *5/00*
U.S. Cl. 204—299 **8 Claims**



An apparatus for conducting electrophoretic analysis comprising a container filled with a conductive gel, two electrodes in the container and means for effecting a voltage across the gel. The container is shaped with deep reservoirs at opposing ends and a relatively shallow mid-section having wells to accommodate a sample to be analyzed. The electrodes extend the width of the reservoirs at about the reservoir midpoint. This apparatus eliminates the need for wicks in gel electrophoresis.

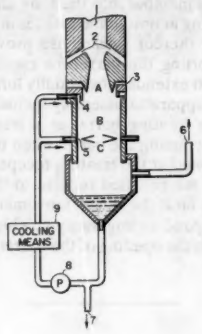
3,674,679

PROCESS AND APPARATUS FOR THE THERMAL CRACKING OF HEAVY HYDROCARBON OILS

Koichi Washimi; Masaaki Kanbayashi, both of Fukushima; Toshio Kanai, and Akihiro Fujimori, both of Kanagawa, all of Japan, assignors to Kureka Kagaku Kogyo Kabushiki Kaisha, Tokyo and Chiyoda Kako Kensetsu Kabushiki Kaisha, Kanagawa, Japan

Filed Feb. 24, 1970, Ser. No. 13,240
Claims priority, application Japan, Feb. 21, 1969, 44/12543
Int. Cl. C10g *9/16, 9/18*
U.S. Cl. 208—48 **11 Claims**

Improvement in thermal cracking of heavy hydrocarbon oils comprising the introduction of a moving film of falling oil on the surfaces of the reaction zone. Apparatus to accomplish this effect is also disclosed The moving oil film prevents the formation of coke otherwise resulting from contact between



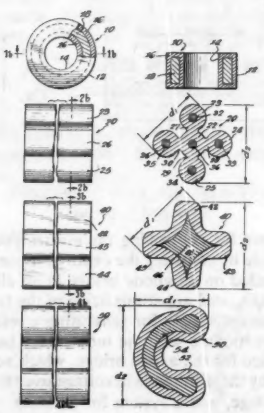
the heated reactor walls and normally liquid reaction products.

3,674,680

PROCESS AND CATALYST FOR HYDROPROCESSING A RESID HYDROCARBON

Gerald B. Hoekstra, South Holland, and Robert B. Jacobs, Homewood, both of Ill., assignors to Standard Oil Company, Chicago, Ill.

Continuation-in-part of Ser. No. 598,046, Nov. 30, 1966, abandoned. This application March 9, 1970, Ser. No. 17,454
Int. Cl. C10g *13/02, 23/00*
U.S. Cl. 208—111 **14 Claims**



A resid hydrocarbon is converted to lower boiling hydrocarbons and/or desulfurized by contacting, in the presence of hydrogen, said resid with a bed of catalyst particles, substantially all of said particles having a surface-to-volume ratio ranging between about 100 and about 250 1/inches, and wherein substantially all points within each of said particles are less than about 0.015 inch from the particle's surface. When one of these particles is circumscribed by a right circular cylinder having an altitude equal to that of the particle, the particle contacts the sidewall of the cylinder at at least three elements and occupies from about 70 to about 90 percent of the cylinder's volume. Preferred particle shapes are cloverleaf, cross, ring and C-shape.

3,674,681

PROCESS FOR ISOMERIZING HYDROCARBONS BY USE OF HIGH PRESSURES

Richard K. Lyon, Fanwood, N.J., assignor to Esso Research and Engineering Company

Filed May 25, 1970, Ser. No. 40,459
Int. Cl. C07c 5/28
U.S. Cl. 208—141 7 Claims

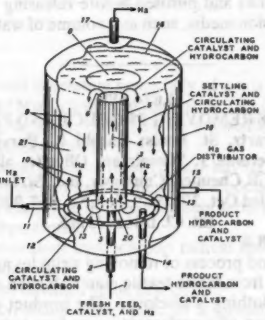
The propensity of hydrocarbons to crack, during isomerization, is minimized by use of high pressure. This process is shown to be especially useful when isomerizing high molecular weight hydrocarbons, such as those found in the residues from petroleum and also highly branched hydrocarbons, both of which cannot be isomerized efficiently by use of prior art methods. In a preferred embodiment the hydrocarbon which is a slack wax is isomerized in a substantially inert solvent, at a pressure of at least 10,000 psi, and in the presence of a Lewis acid catalyst to produce lubricants characterized by their high viscosity index and low pour point.

3,674,682

HEAVY OIL CONVERSION USING FINE PARTICLES

David S. Mitchell, San Rafael; Alan G. Bridge, El Cerrito, and John W. Scott, Ross, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Jan. 16, 1970, Ser. No. 3,304
Int. Cl. C10g 13/18, 23/06
U.S. Cl. 208—157 8 Claims



A process for catalytically hydroconverting a feed heavy hydrocarbon oil to more valuable hydrocarbon liquid, using finely divided catalyst, which process comprises feeding the heavy oil upward in a vertically extending conduit in a reactor vessel, flowing fine catalyst particles upward in said conduit, allowing the heavy oil feed and the fine catalyst particles to flow out from the conduit at an upper end of the conduit, introducing hydrogen gas to the reactor vessel at a first lower part of the reactor vessel and allowing the hydrogen gas to rise upward in the reactor vessel; allowing the fine catalyst particles to settle downward in the reactor vessel outside the conduit and countercurrent to the upward rising hydrogen, and withdrawing valuable hydrocarbon liquid from a second lower part of the reactor vessel.

3,674,683

PROCESS FOR THE REMOVAL OF OIL FROM THE SURFACE OF A BODY OF WATER

Norman B. Rainer, Richmond, Va., assignor to Philip Morris Incorporated, New York, N.Y.

Filed Jan. 2, 1970, Ser. No. 420
Int. Cl. E02b 15/04
U.S. Cl. 210—40 2 Claims

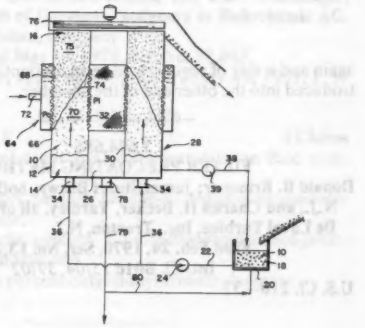
This disclosure relates to a process for removal of oil from the surface of a body of water, wherein a material comprising a particulate microporous hydrophobic vinyl chloride polymer, such as polyvinyl chloride, is applied to the oil.

3,674,684

CONTINUOUS FLUID-SOLID CONTACT METHOD AND APPARATUS

Ayre Gollan, Silver Spring, Md., assignor to Hydronautics Incorporated, Laurel, Md.

Filed July 13, 1970, Ser. No. 54,226
Int. Cl. B01d 15/06, 33/18
U.S. Cl. 210—33 28 Claims



A method and apparatus for removing a first component from a fluid stream comprises contacting the fluid stream with a continuously moving bed of filter material, contained within a separation column, recovering the contaminated filter material, and regenerating it for reuse. The continuously moving bed of filter material is moved through a contact zone in the separation column by creating a hydraulic force on the material from the flow of a carrier liquid through the material. The fluid stream can be an oil-water mixture from which oil is removed by an absorbent filter material.

3,674,685

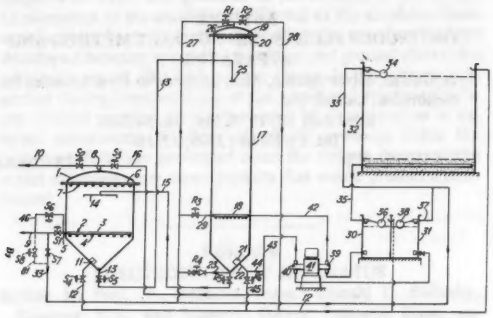
PROCESS OF AND APPARATUS FOR THE ION-EXCHANGE TREATMENT OF LIQUIDS

Thomas Victor Arden, Cobham; Albert George Borra, Isleworth, and Rolf Crowther Clayton, London, all of England, assignors to The Permutit Company Limited, London, England

Filed Aug. 15, 1969, Ser. No. 850,457
Claims priority, application Great Britain, Aug. 22, 1968, 40,239/68; March 17, 1969, 13,926/69
Int. Cl. B01d 15/06
U.S. Cl. 210—33 11 Claims

In a continuous ion-exchange process in which resin moves intermittently through a circuit including an absorber and a regenerator, the absorber is spanned by a liquid-distributing system, and at each intermittent movement a slug of resin wholly occupying the space in the absorber between this system and one end of the absorber is discharged while service

flow continues. The remainder of the bed in the absorber is moved in the direction of the space thus emptied so as to fill it again and a slug of regenerated resin of identical volume is introduced into the other end of the absorber.



3,674,686

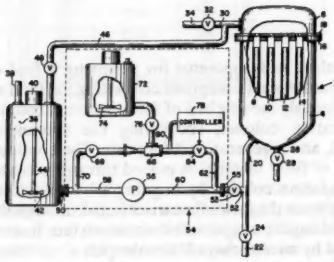
FILTER PRECOATING METHOD

Donald B. Brimmer; James Stuart Brown, both of Willingboro, N.J., and Charles H. Becker, Yardley, all of Pa., assignors to De Laval Turbine, Inc., Trenton, N.J.

Filed Feb. 24, 1970, Ser. No. 13,268

Int. Cl. B01d *15/04, 37/02*

U.S. Cl. 210—37 **6 Claims**



To control the flocculation of a mixture of fine anion and cation ion exchange resins in order to form an even coating on a filter septum, the resins are first mixed in a heavy slurry, and are then added at a controlled rate to the recirculation liquid entering the filter vessel.

3,674,687

STORM SEWAGE TREATMENT

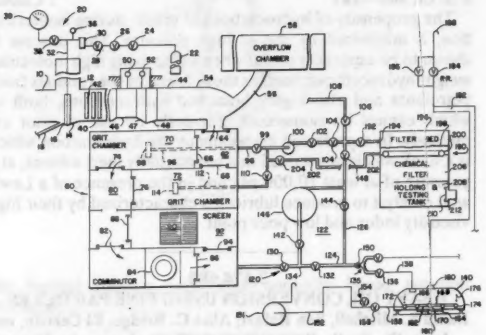
Harold G. Quase, Rock Creek Hills, Kensington, Md., assignor to Underwater Storage, Inc., Washington, D.C.

Filed Sept. 19, 1969, Ser. No. 859,390

Int. Cl. B01d *21/24*

U.S. Cl. 210—86 **2 Claims**

Street runoff or storm sewage is measured and solids are separated from the liquid first by a grit chamber and screen. Remaining solids are ground by a comminutor, and the fluid is pumped into large temporary storage tanks. The elongated low profile and wide storage tanks are preferably submerged in a body of water, and while sewage is in the tanks, air is continually bubbled upward through the tanks. When excess runoff has ceased, the storm sewage is pumped from the temporary storage tanks and purified before releasing it into a permanent dispersion media, such as a volume of water.



3,674,688

WRINKLE REMOVING PRODUCT AND PROCESS

Leonard Schwartz, St. Louis; Harold K. Purcell, Pasadena Hills, and Jerome J. Wieselman, Olivette, all of Mo., assignors to RLR Chemical Company, Inc., St. Louis, Mo.

Filed Oct. 20, 1969, Ser. No. 867,920

Int. Cl. D06m *13/46*

U.S. Cl. 252—8.8 **2 Claims**

A product and process of removing wrinkles and surface effect blemishes from fabric textile materials such as upholstery, drapery and clothing is disclosed. The product is an alcohol-aqueous solution of a surfactant or surface tension reducing material which is a liquid at room temperature and which will evaporate to dryness in a short time. The surfactant material is preferably a quartenary ammonium compound with a dialkyl dimethyl ammonium chloride compound being most satisfactory. The process of using the wrinkle removing material involves spraying the aqueous-alcoholic solution on the wrinkled fabric and allowing the fabric to dry. The wrinkle removing material will usually evaporate to dryness in from 15 minutes to 1 hour.

3,674,689

CARBON FIBER FILLED COMPOSITE MATERIALS

Jeremy Peter Giltrow, Bordon; George Henry Kinner, Fleet, and John Keith Lancaster, Reading, all of England, assignors to National Research Development Corporation, London, England

Filed June 23, 1970, Ser. No. 49,153

Claims priority, application Great Britain, June 25, 1969, 31,999/69

Int. Cl. C10m *0/52*

U.S. Cl. 252—12.4 **17 Claims**

At least the contacting surface of a bearing component is a composite material wherein metal coated carbon fibers are incorporated as reinforcement in a matrix of synthetic resin. Such bearing components have low wear rates and show low friction.

3,674,690

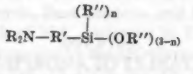
AIR DRYING SILICONE RESIN BONDED DRY FILM LUBRICANT

William L. Clow, Fairborn; Robert J. Benzing, Xenia, and Bobby D. McConnell, Dayton, all of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force

Filed July 8, 1969, Ser. No. 840,022
Int. Cl. C10m 7/50, 7/06
U.S. Cl. 252—25 24 Claims

The process described herein comprises an air drying solid film lubricant and the process for the preparation thereof and for applying the same to substrate metals. The air drying solid film lubricant comprises a binder and a lubricant, which binder consists essentially of a siloxane prepolymer having at least 10 repeating units of the formula

mixed in an inert solvent with an aminoalkyl-silane having the formula



and the lubricant consisting essentially of a mixture of molybdenum sulfide (MoS_2) and antimony oxide (Sb_2O_3), wherein

R is hydrogen, alkyl, cycloalkyl or aminoalkyl of no more than ten carbon atoms;

R′ is a divalent hydrocarbon radical having at least three carbon atoms and having the valence bonds which are attached to the N and Si of the formula separated by at least three carbon atoms;

R″ is a monovalent hydrocarbon radical having one to six carbon atoms; and

n is an integer having a value of 0–2;

said aminoalkyl-silane being used in a proportion of 3–25 parts per 100 parts of said siloxane prepolymer; said solvent being used in a proportion to give 20–40 parts solvent per part of binder; said molybdenum sulfide and antimony oxide per part of molybdenum sulfide; and said mixture being used in the range of from 30 volumes of lubricant mixture per 70 volumes of binder up to 85 volumes of lubricant per 15 volumes of binder, preferably 50–85 volumes of lubricant per 100 volumes of lubricant-binder mixture.

Other solid lubricant mixtures which may be used include replacement of the molybdenum sulfide by molybdenum diselenide, tungsten disulfide, tungsten diselenide and the like, and/or replacement of the antimony trioxide by zinc oxide (ZnO) or bismuth oxide (Bi_2O_3) and the like.

3,674,691

MINERAL LUBRICATING OIL CONTAINING HIGH MOLECULAR WEIGHT ALKYL SUBSTITUTED PHENOLIC SULFONAMIDE

Robert E. Karll, Munster, Ind., and Richard J. Lee, Park Forest, Ill., assignors to Standard Oil Company, Chicago, Ill.

Filed April 1, 1970, Ser. No. 24,807
Int. Cl. C10m 1/40, 1/36
U.S. Cl. 252—47.5 5 Claims

Polymethylene polyamine sulfonamides of alkyl-substituted phenolic sulfonic acids wherein the alkyl-substituent has a molecular weight within the range of 400 to 3000 are novel compounds soluble in mineral hydrocarbon oils of the lubricating oil range and as solutes therein are ashless addition agents imparting to the solution a combination of anti-oxidant and detergency-dispersancy properties useful in the lubrication of internal combustion engines. Illustrative of such sulfonamides are mono- and disulfonamides of hexamethylene diamine, tetraethylene pentamine, 2,6-di(aminoethyl) pyridine and N,N′-di(aminopropyl) piperazine with 4-alkylphenolic sulfonic acids such as 4-alkyl-1-hydroxyphenyl, 4,4′-dialkyl-1,1′-dihydroxy-2,2′-biphenyl, 4-alkyl-1-alkoxyphenyl or 2-tri- and tetra-(4′-alkyl-1-hydroxybenzyl)-substituted 4-alkyl-1-hydroxyphenyl sulfonic acid chlorides.

3,674,692

LUBRICANTS AND POWER TRANSMISSION FLUIDS ON THE BASIS OF CARBOXYLIC ACID ESTERS

Herbert Gothel, Oberhausen-Holten, and Hans Feichtinger, Dinslaken, both of Germany, assignors to Ruhrchemie AG, Oberhausen-Holten, Germany

Filed May 13, 1970, Ser. No. 37,043
Claims priority, application Germany, May 16, 1969, P 19 25 048.7
Int. Cl. C10m 1/26
U.S. Cl. 252—56 S 3 Claims

A MIL 7808 lubricant and power transmission fluid comprising:

55 to 70 weight percent hexane-1, 6-diol-isononanoate-ethylhexanoate;

15 to 30 weight percent 2,2-dimethylpropanediol-pelargonate-nonanoate; and

10 to 20 weight percent octyl-nonyl-trimethyladipate.

3,674,693

REVERSAL ELECTROSTATIC TONER COMPOSITION

Alexander U. Averbach, Skokie, Ill., assignor to A. B. Dick Company, Chicago, Ill.

Filed May 25, 1970, Ser. No. 41,157
Int. Cl. G03g 9/04
U.S. Cl. 252—62.1 9 Claims

A liquid developer composition for reversal toning of a latent electrostatic image which comprises a tone concentrate formed of finely divided pigment particles dispersed in a mixture of a polymeric binder, a high dielectric diluent and a phospholipid charge stabilizing material which is admixed with an aliphatic carrier liquid to provide the developer composition.

3,674,694

MANGANESE ZINC-FERRITE CORE

Georg Stadler, Balanstrasse 103, 8000 Munich 90, and Erwin Vogg, Mitlenwaldstrasse, 8000 Munich 55, both of Germany, assignors to Siemens Aktiengesellschaft Berlin and Munich

Continuation-in-part of Ser. No. 819,034, April 24, 1969, abandoned. This application April 5, 1971, Ser. No. 131,555
Claims priority, application Germany, May 17, 1968, P 17 71 398.3
Int. Cl. C04b 35/38
U.S. Cl. 252—62.59 3 Claims

A manganese-zinc ferrite core having an essentially linear relation between permeability and temperature over the temperature zone ranging from about −40° C. to about +60° C. and being composed of starting material of about 50 to 55 mol percent of Fe_2O_3, about 23 to 35 mol percent of MnO, about 10 to 25 mol percent of ZnO, up to 3 mol percent of TiO_2, about 0.02 to 0.2 percent by weight of CaO and about 0.05 to 1 percent by weight NiO.

3,674,695

ELECTRICAL INSULATING COMPOSITIONS BASED ON OLEFIN POLYMERS

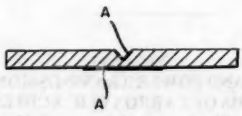
Franz Wuerstlin, and Franz Feichtmayr, both of Ludwigshafen, Germany, assignors to Badische Anilin & Soda-Fabrik Aktiengesellschaft, Ludwigshafen/Rheinland, Rheinland-Pfalz, Germany

Filed May 11, 1970, Ser. No. 35,963

Claims priority, application Germany, May 9, 1969, P 19 23 708.2

Int. Cl. C07c *119/00;* C08f *45/60;* H01b *3/18*

U.S. Cl. 252—63.2 3 Claims



Electrical insulating materials based on olefin polymers and containing agents for increasing their electric strength. The electrical insulating materials according to the invention contain special azomethines as the agents for increasing electric strength. Insulations prepared from these materials do not fail even under prolonged influence of a high voltage.

3,674,696

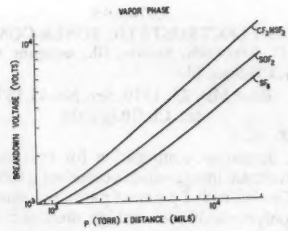
GASEOUS DIELECTRIC MATERIALS

James Edward Griffiths, Murray Hill, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 30, 1970, Ser. No. 102,706

Int. Cl. H01b *3/18*

U.S. Cl. 252—63.7 9 Claims



Materials are described which are useful as gaseous dielectric insulators in electrical devices. These materials are a group of sulfur compounds which have two fluorine atoms and at least one perfluoroalkylimino group attached to the sulfur atom. It has been discovered that the substitution of a perfluoroalkylimino group for an oxygen atom attached to a sulfur atom increases the dielectric breakdown voltage of the molecule. These gaseous materials can be used both in substantially pure form or mixed with inert gaseous material. They exhibit high breakdown voltages and in addition do not yield undesirable reaction products when exposed to dielectric breakdown.

3,674,697

STYRENATED TRIARYL PHOSPHATE FUNCTIONAL FLUIDS

Silvio Louis Giolito, Whitestone, N.Y., assignor to Stauffer Chemical Company, New York, N.Y.

Filed Feb. 24, 1970, Ser. No. 13,781

Int. Cl. C09k *3/00*

U.S. Cl. 252—78 2 Claims

The transmission of pressure in a closed hydraulic system is accomplished by using an effective amount of styrenated phenyl bis(isopropylphenyl) phosphate.

3,674,698

TRANSMITTING PRESSURE IN A HYDRAULIC SYSTEM

Edward D. Weil, Hastings-on-Hudson, N.Y., assignor to Stauffer Chemical Company, New York, N.Y.

Filed Feb. 24, 1970, Ser. No. 13,782

Int. Cl. C09k *3/00*

U.S. Cl. 252—78 4 Claims

The transmission of pressure in a closed hydraulic system is accomplished by using an effective amount of benzylated and/or styrenated triaryl phosphate.

3,674,699

NONCORROSIVE CLEANING COMPOSITION AND PROCESS

Friedrich Dittel, Mainz-Kostheim, and Peter Jorns, Frankfurt am Main, both of Germany, assignors to Hooker Chemical Corporation, Niagara Falls, N.Y.

Filed Feb. 11, 1970, Ser. No. 10,626

Int. Cl. C23f *11/08;* C23g *1/16, 1/18*

U.S. Cl. 252—135 10 Claims

An improved composition and process for cleaning metal surfaces, and particularly aluminum and aluminum alloy surfaces wherein the cleaning is effected by using an aqueous alkaline solution which contains borates as the main alkaline component and, additionally, contain one or more vanadium compounds. Additionally, if desired, the cleaning compositions may also contain one or more non-ionic surface active agents and/or an ionic wetting agents.

3,674,700

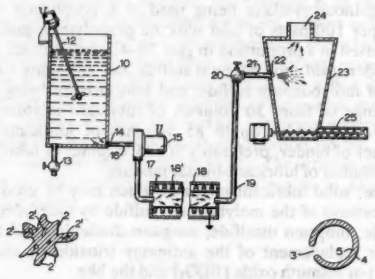
DETERGENT TABLET OF AMORPHOUS SODIUM SILICATE HAVING INHERENT BINDING PROPERTIES, CONTAINING A SURFACTANT, AND METHOD OF MAKING SUCH TABLET

Conrad J. Gaiser, 24 66th Place, Long Beach, Calif.

Continuation-in-part of Ser. No. 654,230, July 18, 1967, Pat. No. 3,450,494, which is a continuation-in-part of Ser. No. 352,142, March 16, 1964, abandoned. This application April 14, 1969, Ser. No. 815,990. The postion of the term of this patent subsequent to June 17, 1986, has been disclaimed.

Int. Cl. C11d *7/14, 7/48, 17/00*

U.S. Cl. 252—135 8 Claims



Amorphous sodium silicate having a burr-like structure imparting inherent binding properties thereto, is compressed into detergent tablets which contain a surfactant.

3,674,701

ACCELERATOR COMPOSITION

Daniel William Yochum, Merchantville, N.J.; Paul Gordon Haines, Lafayette Hill, and Ivan C. Popoff, Ambler, both of Pa., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed Feb. 17, 1971, Ser. No. 116,250

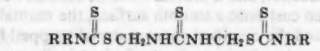
Int. Cl. C08c *11/48*

U.S. Cl. 252—182 5 Claims

Accelerator compositions having high activity which inhibit

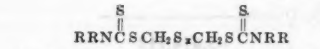
surface bloom in vulcanizates are comprised of a mixture of a thiourea of the structure

(I).



with

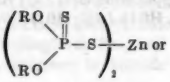
II. a polysulfide of the structure



or

III. tetramethyl thiuram disulfide or a mixture thereof with bis-(oxydiethylene)thiuram disulfide, or

(IV).



V. the zinc salt of the reaction product of ethanolamine, formaldehyde and carbon disulfide.

3,674,702

HYDROGEN GAS GENERATING COMPOSITION AND METHOD FOR THE SAME

Gerald L. MacKenzie, Port Tobacco, and Paul R. Mosher, Indian Head, both of Md., assignors to The United States of America as represented by the Secretary of the Navy

Filed Feb. 25, 1970, Ser. No. 17,994
Int. Cl. C01b *6/04, 1/05*
U.S. Cl. 252—188 **10 Claims**

Compositions of a metal hydride, such as lithium hydride, aluminum metal and an elastomer binder, such as butyl rubber, which generate hydrogen gas upon being dispersed in water.

3,674,703

PREPARATION OF SILVER DISPERSIONS FOR USE IN FILTER AND ANTIHALATION LAYERS

Franz Moll, Leverkusen; Rolf-Fred Posse, and Werner Ringe, both of Cologne, all of Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed March 26, 1970, Ser. No. 23,033
Claims priority, application Germany, April 5, 1969, P 19 17 745.8
Int. Cl. B01j *13/00;* **G03c** *1/84*
U.S. Cl. 252—313 R **1 Claim**

Silver dispersions for photographic filter and antihalation layers are produced by reduction of an aqueous silver salt solution containing a protective colloid with a compound of the oxytetronic acid series, such as ascorbic acid. Reduction is carried out in the presence of cadmium ions. This causes the silver to be precipitated in very fine grains in the dispersion so that neutral gray silver dispersions with a high covering power are obtained.

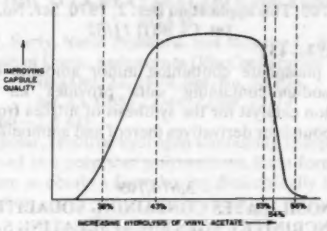
3,674,704

PROCESS OF FORMING MINUTE CAPSULES AND THREE-PHASE CAPSULE-FORMING SYSTEM USEFUL IN SAID PROCESS

Robert G. Bayless; Charles P. Shank; Ruth A. Botham, and Dennis W. Werkmeister, all of Dayton, Ohio, assignors to The National Cash Register Company, Dayton, Ohio

Filed March 29, 1971, Ser. No. 128,670
Int. Cl. B01j *13/02;* **B44d** *1/02*
U.S. Cl. 252—316 **8 Claims**

A process is disclosed for manufacturing minute capsules, en masse, in a liquid manufacturing vehicle wherein the capsules contain water or aqueous solutions. The capsules have seamless walls of a specific kind of hydrophobic polymeric material which polymeric material has been found particularly impervious to permeation and diffusion by the aqueous contents. The hydrophobic polymeric material used is poly(ethylene-co-vinyl acetate) having the vinyl acetate groups hydrolyzed to vinyl alcohol groups in the amount of 38 to 55 percent.



3,674,705

NON-MASSING DIARYL-P-PHENYLENE DIAMINES

Frederick Paul Hytrek, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed July 30, 1969, Ser. No. 846,275
Int. Cl. C08d *11/04;* **C08g** *51/60*
U.S. Cl. 252—400 **10 Claims**

A non-massing antiozonant for chloroprene polymer rubbers prepared by mixing a finely divided inorganic material having a high surface area and a high oil absorption capacity with a diaryl-p-phenylene diamine composition. The diaryl-p-phenylene diamine is molten during the mixing operation. The antiozonant is highly resistant to caking and maintains its free-flowing particulate form during normal conditions of storage and use.

3,674,706

TIN IMPREGNATION REGENERATION OF GROUP VIII REFORMING-DEHYDROGENATION CATALYSTS

E. O. Box, Jr.; Lewis E. Drehman, and Floyd E. Farha, Jr., all of Bartlesville, Okla., assignors to Phillips Petroleum Company

Filed June 3, 1970, Ser. No. 43,202
Int. Cl. B01j *11/18, 11/02*
U.S. Cl. 252—412 **7 Claims**

Deactivated catalysts containing Group VIII metal contact agents are regenerated by a process comprising impregnating the deactivated composite material with tin or a tin compound. Preferably, the tin-impregnated composite is thereafter calcined. The process is particularly suitable for the regeneration of deactivated reforming and dehydrogenation catalysts.

3,674,707

REGENERATION OF SULFUR-POISONED RANEY NICKEL CATALYST

William Johan Meindert Pieters, Denville, N.J.; John Freel, Oakmont, Pa., and Robert Bernard Anderson, Ancaster, Ontario, Canada, assignors to W. R. Grace & Co., New York, N.Y.

Filed Oct. 21, 1970, Ser. No. 82,863
Int. Cl. B01j *11/76, 11/30, 11/02*
U.S. Cl. 252—413 **10 Claims**

Raney nickel catalysts which have been sulfur poisoned are regenerated by successive treatment first in an aqueous organic acid solution containing metal ions that form an insoluble sulfide in acid solutions, but which are soluble or decompose to soluble products and in an aqueous base solution. The catalyst is then separated and washed to remove traces of treating substances. The regenerated catalyst has an activity comparable to the freshly prepared catalyst.

3,674,708

IMPROVED BORON PHOSPHATE CATALYST

Robert T. Somich, Lake Jackson, Tex., assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 736,299, June 12, 1968, Pat. No. 3,574,700. This application Dec. 2, 1970, Ser. No. 94,560

Int. Cl. B01j *11/82*

U.S. Cl. 252—432 5 Claims

Boron phosphate containing minor amounts of sulfate- and/or sodium-containing salts provides an improved dehydration catalyst for the synthesis of nitriles from carboxylic compounds or derivatives thereof and ammonia.

3,674,709

ALUMINOSILICATES CONTAINING SODALITE AND/OR CANCRINITE CAGES ENCAPSULATING SALTS

Richard M. Barrer, Bromley, England, and John F. Cole, Amsterdam, Netherlands, assignors to Air Products and Chemicals, Inc., Wayne, Pa.

Filed Oct. 8, 1969, Ser. No. 864,909

Claims priority, application Great Britain, Oct. 11, 1968, 48,308/69

Int. Cl. B01j *11/58, 11/40*

U.S. Cl. 252—454 9 Claims

Kaolinite and a salt are subjected to hot aqueous alkali for at least 2 days to prepare a crystalline zeolite (e.g., cancrinite and/or sodalite) having the salt encapsulated in the cages of the crystalline zeolite.

3,674,710

RANEY MIXED CATALYST

Gerhard Richter; Magdalena Kroes, and Angelika Frietzsche, all of Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Berlin, Germany

Filed May 11, 1970, Ser. No. 35,950

Claims priority, application Germany, May 10, 1969, P 19 23 920.4

Int. Cl. B01j *11/32*

U.S. Cl. 252—465 21 Claims

A Raney mixed catalyst for use as a fuel cell electrode. The catalyst contains nickel, molybdenum and one of the metals titanium or zirconium. The catalyst is prepared from a Raney alloy, which contains aluminum as the inactive component. The alloy is in at least partially homogeneous quarternary phase.

3,674,711

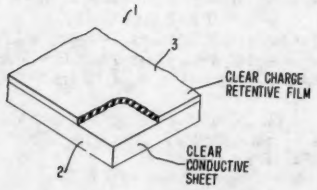
ELECTRICALLY CONDUCTIVE TRANSPARENT PLASTIC MATERIAL

Bert Growald, Los Altos; John A. Dahlquist, Palo Alto, and Guy A. Marlor, Santa Clara, all of Calif., assignors to Varian Associates, Palo Alto, Calif.

Filed Dec. 10, 1969, Ser. No. 883,732

Int. Cl. H01b *1/00*; C08d *9/06*; C08f *29/12*

U.S. Cl. 252—500 2 Claims



An electrically conductive clear transparent self-supporting plastic sheet consisting of a homogeneous solid molecular mixture of a clear transparent conductive polymer and a film forming clear transparent polymer is obtained by combining a quaternary ammonium polyelectrolyte, such as polydimethyl diallyl ammonium chloride, with a film forming polymer, such as polyvinyl alcohol, and a mutual solvent, such as water. The mixture is then cast onto a smooth surface, the mutual solvent evaporated, and the resultant sheet material stripped from the casting surface to obtain a sheet of electrically conductive clear transparent plastic material useful as a conductive plastic or, after coating with a charge retentive film, as an electrographic recording medium.

3,674,712

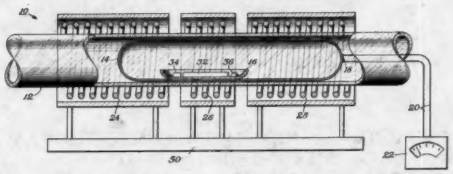
PHOTOCONDUCTIVE DETECTOR MATERIAL

Oran W. Wilson, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 672,399, Oct. 2, 1968, abandoned, which is a continuation of Ser. No. 347,905, Feb. 27, 1964, abandoned. This application Oct. 23, 1968, Ser. No. 770,897

Int. Cl. H01b *1/02*; H01l *3/00, 13/00*

U.S. Cl. 252—501 14 Claims



A photoconductive infrared detector for operation at liquid neon temperatures is disclosed which comprises a semiconductor material consisting essentially of a single crystal of germanium having copper and Group III shallow acceptor impurities which are compensated with arsenic or antimony at a level about one order of magnitude greater than the level of said shallow acceptor impurities, said single crystal of germanium being doped with mercury, the mercury atoms being present to a level in excess of the arsenic or antimony atoms.

3,674,713

ELECTRIC CERAMIC RESISTORS HAVING POSITIVE TEMPERATURE COEFFICIENTS AND METHOD OF MANUFACTURING SAME

Jean Michel Baudry Ghislain Yperman, Sint-Stevens-Welune, and Charles Belhomme, 88 Avenue des Anciens Combattens, Evere, both of Belgium, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 601,343, Dec. 13, 1966, abandoned. This application Jan. 26, 1970, Ser. No. 6,052

Claims priority, application Netherlands, Dec. 18, 1965, 6516534

Int. Cl. H01c *7/02*

U.S. Cl. 252—520 8 Claims

A barium titanate semiconductive resistor having a high positive temperature coefficient of electrical resistance and containing a small amount of a fluoride.

3,674,714

FLUORESCENT 1-(PYRAZOLINYLPHENYLSULPHONYL)PIPERAZINES

Eduard Troxler, Basel, and Heinrich Hausermann, Riehen, both of Switzerland, assignors to Geigy Chemical Corporation, Ardsley, N.Y.

Division of Ser. No. 765,964, Oct. 8, 1968, Pat. No. 3,598,810. This application July 24, 1970, Ser. No. 64,857

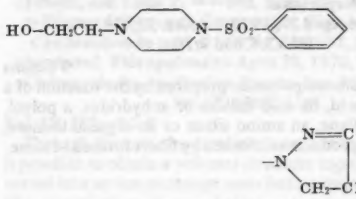
Claims priority, application Switzerland, Oct. 13, 1967, 14364/67

Int. Cl. G11d *3/26*

U.S. Cl. 252—543 4 Claims

Fluorescent 4-substituted 1-(pyrazolinylphenylsulphonyl)-piperazines which are soluble in aqueous acid media, are dis-

closed as optical brighteners for detergent compositions. A typical novel compound is that of the formula



3,674,715

SOLID SOLUBLE POLYMERS FROM 4-VINYLCYCLOHEXENE DIEPOXIDE

Gary L. Statton, Wallingford, Pa., and Richard W. Sauer, Cherry Hill, N.J., assignors to Atlantic Richfield Company, New York, N.Y.

Filed Oct. 1, 1970, Ser. No. 77,351
Int. Cl. C08g *43/00*
U.S. Cl. 260—2 EP **10 Claims**

Soluble solid easily handled polyepoxide polymers can be formed from 4-vinylcyclohexene diepoxide in a catalytic process using a tertiary amine and an active hydrogen containing compound. The powdery polymers of the invention can be easily cured to thermoset resins using coreagents to form castings, laminates, and coatings having exceptional toughness and good strength.

3,674,716

MANUFACTURE OF POLYURETHANES USING ORGANIC VANADIUM COMPOUNDS AS CATALYSTS

Willem Dijkhuizen, Zuidlaren, Netherlands; Erich Termin, Niederkassel, Germany; Otto Bleh, Bergeheim/Sieg, Germany, and Dieter Morgenstern, Rosrath, Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Filed April 27, 1970, Ser. No. 32,340
Claims priority, application Germany, April 30, 1969, P 19 21 952.4
Int. Cl. C08g *22/04, 22/44*
U.S. Cl. 260—2.5 AB **9 Claims**

In the manufacture of a polyurethane by the reaction of a polyol with a polyisocyanate in the presence of a catalyst and in the absence of water, the catalyst used is an organic vanadium compound, preferably a vanadium or vanadyl alcoholate or phenolate, having the formula $(Y)_mV(YR)_a$—2m wherein:

V is a vanadium atom
Y is an oxygen or sulfur atom
R is an organic radical, which can be alike or different if the molecule contains more than one
a is 4 or 5
m is 0 or 1 when *a* is 4, and 1 when *a* is 5.

3,674,717

POLYURETHANE FOAMS PREPARED FROM OXYETHYLATED STARCH-PHOSPHORUS-CONTAINING POLYETHERS

Stephen Fuzesi, Hamden, and Milton Lapkin, Barrington, both of R.I., assignors to Olin Corporation

Continuation-in-part of Ser. No. 735,930, Feb. 20, 1968, abandoned, which is a division of Ser. No. 457,814, May 21, 1965, Pat. No. 3,399,190. This application Oct. 5, 1970, Ser. No. 78,193
Int. Cl. C08g *22/14, 22/46*
U.S. Cl. 260—2.5 AS **6 Claims**

Flame-retardant polyurethane foams having open cells are prepared from a polyether polyol, an organic polyisocyanate, a foaming agent and a catalyst, wherein the polyether polyol is oxyethylated starch-phosphorus-containing polyether.

3,674,718

DIELECTRICALLY HEAT SEALABLE POLYURETHANE FOAM

Robert M. Early, North Branford, and Maurice C. Raes, Branford, both of Conn., assignors to Olin Corporation

Filed Oct. 22, 1970, Ser. No. 38,121
Int. Cl. C08g *22/44, 22/08, 22/14*
U.S. Cl. 260—2.5 AQ **10 Claims**

Highly polar, reactive-hydrogen-containing compounds are incorporated in a polyether polyurethane foam-forming reaction mixture to obtain a foam having dielectrically heat sealable properties.

3,674,719

PROCESS FOR PREPARING MICROPOROUS, OPEN-CELLED CELLULAR POLYAMIDE, POLYESTER AND POLYACETAL STRUCTURES

Francis Edward Jenkins, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 23, 1970, Ser. No. 101,172
Int. Cl. C08j *1/26, 1/28*
U.S. Cl. 260—2.5 M **17 Claims**

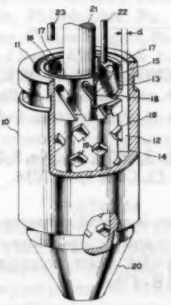
A process for preparing microporous, open-celled cellular polyamide, polyacetal and polyester structures which comprises (a) dissolving the starting polymer in formic acid, hexafluoroisopropyl alcohol, hexafluoroacetone hydrate or mixtures thereof; (b) dispersing in the resulting solution a liquid chlorofluorocarbon; (c) cooling the dispersion to at least the solidification temperature of the chlorofluorocarbon; and (d) removing the chlorofluorocarbon from the dispersion at a temperature of from about 0° C. to the solidification temperature of said chlorofluorocarbon.

3,674,720

PROCESS FOR MIXING COREACTIVE LIQUIDS WHICH FORM POLYURETHANES

Donald Dunn, Cincinnati, Ohio, assignor to The Cincinnati Milling Machine Company, Cincinnati, Ohio

Filed Nov. 19, 1969, Ser. No. 878,081
Int. Cl. C08g *22/04, 22/44*; B01f *7/32*
U.S. Cl. 260—2.5 BC **12 Claims**



A process and apparatus for intimately mixing two or more mutually coreactive liquids such as polyols and polyisocyanates comprising:

A. passing the liquids, while in a substantially unmixed state, through a plurality of very small holes such as that provided by a screen, and immediately thereafter
B. subjecting the liquids to a high shear.

The present process and apparatus find particular utility in the production of high density, foamed polyurethane moldings.

3,674,721

PROCESS FOR PREPARING FLEXIBLE POLYURETHANE FOAMS AND COATINGS

Carl Albert Aufdermarsh, Jr., and Adolf Wojciech Fogiel, both of Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 821,085, May 1, 1969, abandoned, which is a continuation-in-part of Ser. No. 765,012, Oct. 4, 1968, abandoned. This application Feb. 3, 1970, Ser. No. 8,421

Int. Cl. C08g *22/34, 22/44*

U.S. Cl. 260—2.5 AC 13 Claims

Polyurethane foams and coatings. The foams are prepared from organic polyisocyanates, polyols and water in quasi-prepolymer, full prepolymer or one-shot systems using a substituted amidine catalyst. The coatings are conventional isocyanato-terminated polyurethane prepolymers cured with moisture in the presence of a substituted amidine.

3,674,722

MICROPOROUS STRUCTURE AND METHOD OF MAKING THE SAME

Norman B. Rainer, Richmond, and Peter A. Wilson, Midlothian, both of Va., assignors to Philip Morris Incorporated, New York, N.Y.

Filed Aug. 10, 1970, Ser. No. 62,647

Int. Cl. C08f *47/08*

U.S. Cl. 260—2.5 M 11 Claims

This disclosure relates to a novel process and to a novel product produced thereby. The product comprises a vinyl chloride polymer having an improved microporous structure and is made by a process which involves dispersing a vinyl chloride polymer latex, i.e., an aqueous suspension of a vinyl chloride polymer, in an organic liquid which is a non-solvent for the polymer, preferably removing most of the water, and heating the resulting dispersion to sinter the vinyl chloride polymer particles to form a microreticulated microporous structure. The vinyl chloride polymer latex may, for example, be a colloidal suspension of polyvinyl chloride particles in water. Such a latex may be obtained commercially or may be prepared by conventional methods. The non-solvent organic liquids should be water-miscible and should have a boiling point above 130° C. and exhibit substantially no solvating or swelling effect on the vinyl chloride polymer. The improved microporous structure of this invention is particularly useful as a filter material. The process of the invention is especially suited for the formation of shaped porous articles which are useful as filters.

3,674,723

ALKYLPHENOL-ALDEHYDE RESINS

Walter A. Vredenburgh, and Samuel D. Hollis, both of Pleasant Hills, Pa., assignors to Pennsylvania Industrial Chemical Corporation

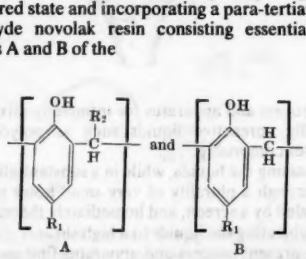
Filed Feb. 3, 1970, Ser. No. 8,442

Int. Cl. C08c *9/04, 9/16*

U.S. Cl. 260—3 3 Claims

A rubber composition is provided having a high degree of tack in the uncured state and incorporating a para-tertiary-butylphenol-aldehyde novolak resin consisting essentially of recurring groups A and B of the

formulae



wherein R_1 is a alkyl; and R_2 is a hydrocarbon radical having 1 to 4 carbon atoms; and wherein the molar ratio of B:A has a value in the range of 0.1 to 0.3.

3,674,724

POLYESTER REINFORCED ELASTOMERS

Alfred Marzocchi, Cumberland, R.I., assignor to Owens-Corning Fiberglas Corporation

Filed April 27, 1970, Ser. No. 32,431

Int. Cl. C08d *9/10*

U.S. Cl. 260—3 9 Claims

A new and improved polyester prepared by the reaction of a polycarboxylic acid, its acid halides or anhydrides, a polyol, and an organo silane, an amino silane or an organic titanate, and elastomeric products reinforced by fibers formed of same.

3,674,725

CATIONIZATION OF STARCH FOR FILLER RETENTION UTILIZING A CATIONIC POLYEPIHALOHYDRIN-TERTIARY AMINE POLYMER

Thomas Aitken, Chicago; Donald R. Anderson, Oswego, and Myron J. Jursich, Chicago, all of Ill., assignors to Nalco Chemical Company, Chicago, Ill.

Filed Dec. 18, 1970, Ser. No. 99,686

Int. Cl. C08b *25/02*; D21h *3/28*

U.S. Cl. 260—9 18 Claims

A method of cationization of starch is disclosed which involves reacting starch at alkaline conditions with a polymer formed from polyepichlorohydrin and an amine.

3,674,726

PAPER COATING COMPOSITION COAGULATABLE BY HEATING

Mahlon Randall Kirk, South Windham, Maine, assignor to Scott Paper Company, Delaware County, Pa.

Continuation-in-part of Ser. No. 634,909, May 1, 1967, abandoned. This application Sept. 4, 1970, Ser. No. 69,951

Int. Cl. C08d *7/18, 13/16*

U.S. Cl. 260—17.4 ST 7 Claims

A paper coating composition which is fluid at 25° C. but coagulates or flocculates when heated to an elevated temperature comprising an aqueous slurry of a conventional mineral pigment and adhesive binder which slurry contains an ionic dispersant for the pigment, the efficiency of which does not change appreciably with heating, and a counteracting agent for the dispersant that is relatively insoluble at 25° C. but solubilizes at an elevated temperature in the range of 35° to 100° C. sufficiently to counteract the dispersant and cause the composition to coagulate or flocculate.

3,674,727

UNSATURATED POLYESTERS

Frank Fekete, 4403 McKenzie Drive, Monroeville, Pa., and John S. McNally, 457 Glenview Drive, Lower Burrell, Pa.

Filed Oct. 20, 1970, Ser. No. 82,544

Int. Cl. C08f *21/02*; C08g *17/12*

U.S. Cl. 260—22 D 17 Claims

An unsaturated polyester prepared by reacting under esterification conditions the following reactants;

a. an ethylenically unsaturated dicarboxylic acid;
b. tetrahydrophthalic anhydride or endomethylene tetrahydrophthalic anhydride;
c. an aliphatic saturated dicarboxylic acid or a dimer or trimer of an ethylenically unsaturated aliphatic monocarboxylic acid; and
d. cyclohexanedimethanol or a mixture of neopentyl glycol and a second dihydric alcohol.

Upon crosslinking or curing the unsaturated polyester with a vinyl monomeric crosslinking agent, there can be obtained products having improved thermal stability properties.

3,674,728

ION EXCHANGE RESINS

Jack V. Carbonnel; Paul D. Grammont, both of Chauny, France, and Louis E. Werotte, Bruxelles, Belgium, assignors to Diamond Shamrock Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 698,692, Jan. 18, 1968, abandoned. This application April 30, 1970, Ser. No. 33,512
Claims priority, application France, Jan. 30, 1967, 6792937
Int. Cl. C08f *15/40*
U.S. Cl. 260—2.2 R 1 Claim

Through the use of a combination of cross-linking agents it is possible to obtain a polymer structure capable of being converted into an ion-exchange resin having improved properties. This combination of cross-linking agents comprises two compounds, one aliphatic and one aromatic, each of which has at least two double bonds.

3,674,729

CORRECTION FLUID COMPOSITION

William M. Mirick, Worthington, Ohio, assignor to The Battelle Development Corporation, Columbus, Ohio

Filed July 7, 1970, Ser. No. 53,004
Int. Cl. C08f *29/38*
U.S. Cl. 260—23 AR 10 Claims

A significantly nonflammable correction fluid composition of a liquid vehicle and solid constituents with the liquid vehicle consisting essentially of nonflammable polychloro hydrocarbon solvent and with the solid constituents consisting essentially of a small amount of a film-forming acrylate resin and a major amount of an organic optical brightener/silica-modified rutile titanium dioxide pigment accompanied by a small amount of a flatting or extender pigment; the correction fluid composition of utility in photo reproduction of copies by a process wherein erroneous matter of an original is overcoated and corrective matter imprinted on the dried overcoating prior to photo reproducing of correct copies.

3,674,730

POLYVINYL CHLORIDE COMPOSITION

Laurence F. King, Mooretown, Ontario, Canada, assignor to Esso Research and Engineering Company

Filed Oct. 21, 1970, Ser. No. 82,727
Int. Cl. C08f *29/18, 45/62*
U.S. Cl. 260—23 XA 4 Claims

Polyvinyl halide extrusion-blow molding compositions containing calcium-magnesium-zinc stabilizers are improved by the addition of long chain alcohols and esters of long chain hydroxy acids. Clear rigid film and containers of improved clarity and freedom from yellowness, when extruded and blow molded at normal temperatures, are produced.

3,674,731

METHOD FOR PRODUCING WATER-DILUTABLE EPOXY ESTER RESINS CONTAINING COPOLYMERS OF VINYL AND/OR VINYLIDENE COMPOUNDS

Rolf Guldenpfennig, Dossenheim, Germany, assignor to Reichhold-Albert-Chemie Aktiengesellschaft, Hamburg, Postfach, Germany

Continuation-in-part of Ser. No. 673,997, Oct. 9, 1967. This application Oct. 26, 1970, Ser. No. 84,112
Claims priority, application Germany, Nov. 2, 1966, 4450239The portion of the term of this patent subsequent to Feb. 16, 1988, has been disclaimed.
Int. Cl. C08g *45/00*
U.S. Cl. 260—23 EP 1 Claim

The invention relates to a process for the production of improved water-dilutable epoxy resin esters which are prepared as follows:

a. partial esters with hydroxyl groups and epoxy groups are first formed by partial esterification of compounds containing epoxy or hydroxyl groups with mixtures of monocarboxylic acids consisting mainly of unsaturated aliphatic straight chain monocarboxylic acids;

b. the resulting partial esters are then reacted with polybasic carboxylic acids in such a manner that the epoxy resin esters with free carboxyl and free hydroxyl groups are rendered water-dilutable by neutralization with aqueous ammonia or strong organic nitrogen bases;

c. epoxy resin esters are then reacted with aqueous ammonia and/or strong organic nitrogen bases in the presence of water, until they are converted into sufficiently water-dilutable synthetic resins, the improvement comprising:

1. the epoxy resin esters in step (a) and/or
2. in step (b), and/or
3. the unsaturated aliphatic monocarboxylic acids added in step (a), and/or
4. adducts of $\alpha\beta$-unsaturated dicarboxylic acids on unsaturated monocarboxylic acids, preferably added in step (b), and/or
5. the monocarboxylic acids that are used for the production of these adducts,

are copolymerized with at least one polymerizable vinyl and/or vinylidene compound by heating in the presence of polymerization catalysts.

3,674,732

ROSIN MODIFIED PHENOLIC RESINS AND METHOD OF PREPARING SAME

Mario Pitzalis, Arcore; Silvio Vargiu, and Ugo Nistri, both of Milan, all of Italy, assignors to Societa' Italiana Resine S.p.A., Milan, Italy

Filed Dec. 10, 1969, Ser. No. 884,005
Claims priority, application Italy, Dec. 31, 1968, 25743 A/68
Int. Cl. C08g *5/22*
U.S. Cl. 260—25 5 Claims

A method of preparing phenolic resins suitable for the production of inks, characterized in that p-cumyl phenol, formaldehyde, a polyhydroxy alcohol and rosin are polymerized at a temperature of from 130° C. to 270° C. in the presence of a catalyst selected from salts of zinc, calcium, magnesium or manganese with organic or inorganic acids having a dissociation constant (or initial dissociation constant) of less than 1.8×10^{-5}, the molar ratio of p-cumyl phenol to formaldehyde being between 1:2.5 and 1:4 and the quantity of rosin from 150 to 200 parts by weight per 100 parts by weight of the phenol.

3,674,733

COLORED HEAT SHRINKABLE ELASTOMERIC TUBING

Edmond R. Ayella, Philadelphia, Pa., assignor to Penntube Plastics Company, Clifton Heights, Pa.

Filed Feb. 2, 1970, Ser. No. 8,021
Int. Cl. C08d *11/02*; B29c *17/07, 13/00*
U.S. Cl. 260—30.6 8 Claims

This invention relates to polychloroprene based colored heat shrinkable elastomeric tubing having excellent electrical properties and to the method of manufacture.

3,674,734

THERMOSETTING ACRYLIC ENAMEL

Fred W. Parker, Flint, Mich., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 728,904, May 14, 1968, abandoned, and a continuation-in-part of Ser. No. 81,629, Oct. 16, 1970, abandoned. This application March 12, 1971, Ser. No. 123,897
Int. Cl. C08f *45/36*; B01k *5/02*
U.S. Cl. 260—31.2 N 12 Claims

The thermosetting acrylic enamel has as the film-forming constituents a blend of:

1. Interpolymer A which consists essentially of styrene; methyl methacrylate; a soft constituent which is either an alkyl acrylate, or an alkyl methacrylate; hydroxy alkyl acrylate or methacrylate and an α,β-ethylenically unsaturated monocarboxylic acid;

2. Interpolymer B which consists essentially of styrene or methyl methacrylate, a soft constituent described above, hydroxy alkyl acrylate or methacrylate and an α,β-ethylenically unsaturated monocarboxylic acid; and
3. a heat reactive condensate.

The thermosetting acrylic enamel is useful as a finish for automobiles and trucks and can be used as a finish for plastics.

3,674,735

SEMI-VULCANIZED BUTYL RUBBER FOR SEALANT APPLICATIONS

John E. Callan, Trenton, N.J., assignor to Cities Service Company, New York, N.Y.

Filed Dec. 22, 1969, Ser. No. 887,401
Int. Cl. C08c *9/00*
U.S. Cl. 260—33.6 20 Claims

Semi-vulcanized butyl rubber compounds having a Mooney viscosity (ML-3 at 260° F) of about 30 to about 80 are produced by curing a mixture of butyl rubber, a plasticizer and a vulcanizing agent, the latter being employed in an amount that is insufficient for complete vulcanization of the rubber. The resultant semi-vulcanized compounds are readily processible during the formulation of sealant caulks and tapes and are further characterized by good dimensional stability which results from reduced flow of the compound.

3,674,736

PROCESS FOR THE PREPARATION OF PIGMENTED POLYMER POWDERS OF CONTROLLED PARTICLE SHAPE AND SIZE AND SIZE DISTRIBUTION AND PRODUCT

Frank Lerman, and Raymond C. Bartsch, both of Cincinnati, Ohio, assignors to National Distillers and Chemical Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 557,641, June 15, 1966, Pat. No. 3,449,291. This application April 15, 1969, Ser. No. 816,403
Int. Cl. G03g *9/02*; C08f *45/08*, *45/14*
U.S. Cl. 260—41 R 30 Claims

Pigmented polymer powders of average particle size less than 30 microns, which can be of uniform shape and in a narrow size distribution, are prepared by controlled heating, melting and agitation of a liquid dispersion of pigmented polymer in bulk or particle form in the presence of a surfactant or by controlled heating and agitating a liquid containing surfactant to which molten polymer is added. Pigmented powders can thus be obtained having spherical particles of very narrow size distribution approaching uniformity.

3,674,737

REACTION PRODUCTS OF DIALKYLTIN OXIDES AND HIGHER DIALKYLTIN MONOHYDRIC ALIPHATIC SATURATED ALCOHOL ESTERS OF THIOMALIC AND THIOLACTIC ACIDS

Lawrence R. Brecker, Brooklyn, and Alfred Thee, Long Beach, both of N.Y., assignors to Argus Chemical Corporation, Brooklyn, N.Y.

Division of Ser. No. 788,916, Jan. 3, 1969, Pat. No. 3,642,848. This application Jan. 22, 1971, Ser. No. 109,049
Int. Cl. C08f *45/62*
U.S. Cl. 260—45.75 K 9 Claims

Reaction products of higher dialkyltin oxides and higher dialkyltin monohydric saturated alcohol esters of thiomalic and thiolactic acid are provided, that are excellent stabilizers for polyvinyl chloride resins.

3,674,738

ROOM TEMPERATURE VULCANIZABLE SILICONE RUBBER STOCKS

Siegfried Nitzsche; Wolfgang Kaiser; Ernst Wohlfarth, and Paul Hittmair, all of Burghausen/Upper Bavaria, Germany, assignors to Wacker-Chemie G.m.b.H., Munich, Bavaria, Germany

Filed Aug. 13, 1970, Ser. No. 63,608
Claims priority, application Germany, Aug. 13, 1969, P 19 41 285.2
Int. Cl. C08f *11/04*
U.S. Cl. 260—46.5 G 6 Claims

A room-temperature vulcanizable silicone rubber stock is prepared by admixing an essentially linear diorganopolysiloxane having reactive end groups, preferably hydroxyl and groups, and as a crosslinker an organosilicon compound containing both oxime groups bonded to silicon through oxygen atoms and amino groups bonded to silicon through Si—N bonding. These materials can be stored in the absence of moisture and will cure to form elastomeric products upon exposure to moisture. Particularly useful as crosslinking agents are silanes of the general formula $R_aSi(ON=X)_b(NR'R)_c$ wherein R is a monovalent hydrocarbon radical, R' is a monovalent hydrocarbon radical or H, X is RR'C = or $\overline{R^2C}$ = where R^2 is a divalent hydrocarbon radical, a is 0 or 1, b and c have an average value of at least 0.5, $b+c$ is 3 or 4 and $a+b+c$ is 4.

3,674,739

ORGANOSILYLAMINES REACTION BETWEEN ORGANOSILYLAMINE AND A SILANOL-CONTAINING ORGANOSILICON MATERIAL

John C. Goossens, Scotia, N.Y., assignor to General Electric Company

Division of Ser. No. 603,115, Dec. 20, 1966, Pat. No. 3,497,539. This application Feb. 9, 1970, Ser. No. 14,690
Int. Cl. C08f *11/04*
U.S. Cl. 260—46.5 G 3 Claims

Bis-organoaminosilalkylenes and bis-organoaminosilarylenes are used to couple silanol stopped fluids to form gums. The process is fast and the molecular weights of the gums formed are very high with no deleterious byproduct formed during the gum formation. The gums which contain recurring silarylene units are used to make silicone rubber. The rubbers formed have the radiation resistance, hydrolytic stability and high temperature properties which are known characteristics of polysiloxanes containing silarylene groups.

3,674,740

PROCESS OF PRODUCING POLYCARBONATE

Hugo Vernaleken, Krefeld; Otto Court, Neuss, and Kurt Weirauch, Krefeld-Bockum, all of Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Filed April 8, 1970, Ser. No. 26,642
Claims priority, application Germany, April 22, 1969, P 19 20 302.2
Int. Cl. C08g *17/13*
U.S. Cl. 260—47 XA 4 Claims

For carrying out phase boundary surface reactions of components, e.g., production of polycarbonates from phosgene, Bisphenol A, sodium hydroxide and water a reaction tube is used, which comprises a series of residence time sections of relatively large internal tube diameter and alternately positions with respect to mixing sections of smaller internal tube diameter, the mixing sections providing Reynolds numbers greater than 2,000 for the reactants.

3,674,741

COPOLYMER OF POLY(QUINOZOLONE AND IMIDE) AND PROCESS FOR PRODUCING THE SAME

Nishizaki Shunichiro, and Fukami Akira, both of Amagasaki, Japan, assignors to Mitsubishi Electric Corporation

Filed July 24, 1970, Ser. No. 58,148

Claims priority, application Japan, Aug. 1, 1969, 44/60854; Aug. 1, 1969, 44/60855

Int. Cl. C08g *20/32, 33/02*

U.S. Cl. 260—47 CP 12 Claims

A copolymer of poly (quinazolone and imide) containing at least 2 quinazolone rings for each repeating unit of the copolymer, is produced by reacting a primary aromatic diamine, bisbenzoxazinone and an aromatic tetracarboxylic dianhydride or its diester. The copolymer of this invention is characterized by good solubility in various organic solvents and excellent viscosity stability and film formability. It is also characterized by excellent electrical and mechanical properties and good heat stability.

3,674,742

PHOSPHORANE POLYESTERS AND POLYAMIDES

Roger A. Baldwin, La Mirada, and Ming T. Cheng, Buena Park, both of Calif., assignors to Kerr McGee Chemical Corp.

Division of Ser. No. 793,630, Nov. 12, 1968, Pat. No. 3,629,296. This application Sept. 24, 1970, Ser. No. 75,283

Int. Cl. C08g *17/133*

U.S. Cl. 260—47 P 1 Claim

Bis(halophosphoranes) react with diamines or dihydroxy compounds to give phosphorane polyamides or polyesters respectively.

3,674,743

ELASTOMERS FROM POLYHYDROXY POLYDIENES

Joseph A. Verdol, White Plains, N.Y., and Patrick W. Ryan, Glen Mills, Pa., assignors to Atlantic Richfield Company, New York, N.Y.

Continuation of Ser. No. 525,369, Feb. 7, 1966, and a continuation-in-part of Ser. No. 797,347, Jan. 23, 1969, which is a continuation of Ser. No. 536,301, March 22, 1966, abandoned, which is a continuation-in-part of Ser. No. 465,161, June 18, 1965, abandoned. This application May 15, 1970, Ser. No. 37,884

Claims priority, application Canada, Aug. 9, 1965, 937,689

Int. Cl. C08q *22/08, 22/16*

U.S. Cl. 260—73 L 26 Claims

A self-curing solid elastomer is made by reaction of a polyfunctional compound with a polyhydroxyl polymer having at least 2.1 predominantly primary, terminal, allylic hydroxyl groups per molecule, the polymer being made from 1,3-diene and 0 to 75 percent of alpha-monoolefin. The polyhydroxyl polymer has a Brookfield viscosity at 30° C. of about 5 to 20,000 poises and a number average molecular weight of about 400 to 25,000. The polyhydroxyl polymer can have about 40 to 70 percent trans-1,4-unsaturation and about 10 to 30 percent cis-1,4-unsaturation. Suitable polyfunctional compounds reactive with the polyhydroxyl polymer include the polyisocyanates whose reaction results in the formation of urethane linkages.

3,674,744

POLYCONDENSATION IN POLY(TETRAFLUORETHYLENE) REACTOR

Kenneth Porter, and Brian Richardson, both of Harrogate, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Feb. 24, 1970, Ser. No. 13,727

Claims priority, application Great Britain, March 3, 1969, 11,140/69

Int. Cl. C08g *17/01, 20/24*

U.S. Cl. 260—75 M 4 Claims

A process for the preparation of a high molecular weight polymer by a condensation process of a liquid reaction mixture wherein at least one volatile by-product is eliminated, characterized in that said condensation process is carried out in apparatus of such form and so operated that said reaction mixture being subjected to the condensation process has no free surface and removal of volatile product or products from said reaction mixture is effected by diffusion through at least a proportion of the wall of said apparatus which is permeable to said volatile product or products but not permeable to said reaction mixture or said polymer, said proportion of the wall which is permeable serving to separate said reaction mixture from a chemically inert gaseous fluid in which the partial pressure of the volatile by-product, or of the volatile by-products, is continually maintained below the equilibrium partial pressure for the reaction mixture under the conditions of reaction.

3,674,745

NOVEL LIGHT-SENSITIVE COPOLYESTERS

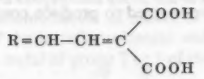
Georges A. Philpot; Marie-Jose-Suzanne Michiels, and Yolande-Paule Marie-Josephe De Villeneuve, all of Vincennes, France, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed March 12, 1970, Ser. No. 19,063

Int. Cl. C08g *17/10*

U.S. Cl. 260—75 VA 6 Claims

There is described a novel group of light-sensitive copolyesters prepared by condensing at least one dihydroxy compound with a mixture of diacids comprising more than 70 and less than 95 mole percent of a diacid having the formula:



where R is an alkylidene, aralkylidene or heterocyclic group and less than 30 but more than 5 mole percent of a non-light-sensitive aromatic diacid.

3,674,746

HIGH CRYSTALLINE TRANSITION TEMPERATURE ELASTOMERS FROM POLYESTER POLYURETHANES

Friedrich Lohse, Allschwil; Rolf Schmid, Reinach/Bl; Willy Fisch, Binningen, and Hans Batzer, Arlesheim, all of Switzerland, assignors to Ciba Limited, Basel, Switzerland

Filed Dec. 2, 1969, Ser. No. 881,628

Claims priority, application Switzerland, Dec. 9, 1968, 18354/68

Int. Cl. C08g *22/10, 22/16, 41/04*

U.S. Cl. 260—75 NP 11 Claims

Manufacture of high molecular, crosslinked crystalline polyadducts possessing urethane groups, from (a) linear succinic acid butane-1,4-diol polyesters possessing terminal hydroxyl groups and having an average molecular size of about 750 to about 5300, (b) as crosslinking agents, polyhydroxyl compounds containing at least 3 hydroxyl groups, preferably those having a hydroxyl equivalent weight of at most 300, e.g., 3-hydroxymethyl-2,4-dihydroxypentane, and (c) diisocyanates, for example hexamethylene-diisocyanate 3,5,5-trimethyl-3-(isocyanato-methyl)-cyclohexane-isocyanate-(1), 2,4-toluylene-diisocyanate or 2,6-toluylene-diisocyanate, with 0.9 to 1.1 equivalents of isocyanate groups of the isocyanate being employed in each case per 1 equivalent of the total amount of hydroxyl groups of the two components (a) and (b).

3,674,747

PROCESS FOR THE PRODUCTION OF HIGH MOLECULAR WEIGHT LINEAR POLYESTERS

Robert Schnegg; Herbert Pelousek, both of Dormagen; Robert Dippolhofer, Leverkusen; Wolfgang Wiegreffe, Krefeld; Hans-Georg Voelz, Krefeld, and Gerhard Kienast, Krefeld, all of Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Dec. 17, 1969, Ser. No. 885,973

Claims priority, application Germany, Jan. 17, 1969, P 19 02 175.1

Int. Cl. C08g *17/015*

U.S. Cl. 260—75 R 6 Claims

A process for the production of high molecular linear polyesters by polycondensing a glycol with terephthalic acid or a terephthalic acid ester in the presence of a polycondensation catalyst. The condensation catalyst is a titanium-dioxide containing 0.01 to 20% by weight of a metal compound, preferably germanium dioxide and antimonium oxide is used as a metal compound. The catalyst can be prepared by calcinating titanium dioxide together with the metal compound.

3,674,748

POLYESTERS CONTAINING AMINOALKYLPHOSPHONATES

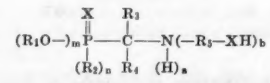
Miltiadis I. Iliopulos, Vienna, W. Va., and Raymond R. Hindersinn, Lewiston, N.Y., assignors to Borg-Warner Corporation, Chicago, Ill.

Division of Ser. No. 714,370, Nov. 9, 1967, abandoned, which is a division of Ser. No. 158,877, Dec. 12, 1961, Pat. No. 3,385,914. This application Dec. 22, 1969, Ser. No. 887,361

Int. Cl. C08g *17/133, 22/10, 22/14*

U.S. Cl. 260—75 P 4 Claims

Selected phosphorus compounds, carbonyl compounds and alkanolamines are reacted to produce compounds of the formula:



wherein m and n are zero to two and $m + n$ equals two; a is zero to 1, b is 1 to 2 and $a + b$ equals 2; X is oxygen or sulfur; R_1, R_2, R_3, and R_4 are organic radicals and R_3 and R_4 can also be hydrogen, and R_5 is an alkyl group. Such compounds can be reacted with carboxylic compounds to produce polyesters, or with epoxides to form polyethers. Such polyesters and polyethers, as well as the compounds themselves, can be reacted with isocyanates to produce polyurethane compositions. When the reaction is carried out in the presence of a foaming agent, cellular products are produced.

3,674,749

POLYIMINOQUINAZOLINEDIONES

James M. Craven, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 26, 1970, Ser. No. 71,285

Int. Cl. C08g *22/04*

U.S. Cl. 260—77.5 CH 9 Claims

A novel polyiminoquinazolinedione composition which is the reaction product of a multifunctional isocyanate and a multifunctional o-aminonitrile.

3,674,750

QUARTERNARY PHOSPHONIUM SALT CATALYZED SYNTHESIS OF URETHANES AND POLYURETHANES

Donnie G. Brady, Bartlesville, Okla., assignor to Phillips Petroleum Company

Filed Jan. 14, 1971, Ser. No. 106,545

Int. Cl. C08g *22/34*

U.S. Cl. 260—77.5 R 8 Claims

A process for producing urethanes by reacting an alkyl halide and an alkali metal cyanate in the presence of an organo hydroxy compound employing a phosphonium salt as a catalyst in which process the isolation of the intermediate isocyanate is unnecessary.

3,674,751

METHOD OF MANUFACTURING POLYAMIDES BY ALKALINE POLYMERIZATION OF CYCLIC LACTAMS

Jaroslav Kralicek, Praha; Vladimir Kubanek, Kralupy; Jitka Solcova, and Jaroslava Kondelikova, both of Praha, all of Czechoslovakia, assignors to Zavody Antoniza Zapotockeho, narodni podnik, Jaromer, Czechoslovakia

Filed Dec. 22, 1969, Ser. No. 887,399

Int. Cl. C08g *20/18*

U.S. Cl. 260—78 L 7 Claims

An improved process for manufacturing polyamides by alkaline polymerization of cyclic lactams which consists of reacting alkali metal hydroxides or alcoholates with the lactams, with water or the corresponding alcohol being removed and putting the reaction mixture into contact with molecular sieves.

3,674,752

COPOLYAMIDES FROM 1,6-OR 2,6-NAPHTHALENE DICARBOXYLIC ACID

James S. Ridgway, Pensacola, Fla.; Henry L. King, Cary, N.C., and Oscar A. Pickett, Jr., Pensacola, Fla., assignors to Monsanto Company, Saint Louis, Mo.

Continuation-in-part of Ser. No. 633,719, April 26, 1967, abandoned. This application Sept. 23, 1969, Ser. No. 860,427

Int. Cl. C08g *20/20*

U.S. Cl. 260—78 R 3 Claims

Synthetic fibers prepared from copolymers of hexamethylene diamine-adipic acid and hexamethylene diamine-1-6- or 2,6-naphthalene dicarboxylic acid are produced which are particularly useful in providing textile and reinforcing fibers.

3,674,753

STABILIZATION OF POLYMER-ALKALI METAL MERCAPTIDES

Carl A. Uraneck, and William J. Trepka, both of Bartlesville, Okla., assignors to Phillips Petroleum Company

Filed July 2, 1970, Ser. No. 52,140

Int. Cl. C08g *23/00*

U.S. Cl. 260—79 6 Claims

Polymers having at least one terminal alkali metal mercaptide end group per molecule are converted to products having improved oxidative stability by reaction with metal halides of Group 4a of the Periodic Table.

3,674,754

VULCANIZABLE ETHYLENE/PROPYLENE COPOLYMERS AND PROCESS FOR THEIR PREPARATION

Nazzareno Cameli; Paolo Longi, and Alberto Valvassori, all of Milan, Italy, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Sept. 4, 1970, Ser. No. 69,987

Claims priority, application Italy, Sept. 5, 1969, 21674 A/69

Int. Cl. C08f *15/40*

U.S. Cl. 260—79.5 B 8 Claims

There are disclosed new vulcanizable copolymers of ethylene and propylene containing unsaturations resulting from the presence therein of units deriving from the mixture obtained by the catalytic isomerization of vinylnorbornene said copolymers containing ethylene, propylene, ethylidene norbornene and at least one other diene selected from the group consisting of vinyl norbornene and vinyl norbornene and dicyclopentadiene. The copolymers have vulcanization rates comparable to those of ethylene/propylene/ethyli denenorbornene copolymers and yield elastomers having

characteristics comparable to those of the vulcanized ethylene/propylene/ethylidenenorbornene copolymers, but are substantially more economical.

The new modified ethylene/propylene copolymers are obtained by copolymerizing a mixture of the starting monomers in contact with catalysts prepared from hydrocarbon-soluble vanadium compounds and hydrides or organometallic compounds of beryllium, aluminum, or lithium-aluminum compounds.

3,674,755

PROCESS FOR COPOLYMERIZING ALPHA-MONOOLEFINS WITH OR WITHOUT A POLYENE, USING CATALYST COMPRISING ORGANOALUMINUM COMPOUND AND VANADYL COMPOUND CONTAINING CYCLIC HYDROCARBON GROUP

Keisaku Yamamoto, Ibaraki; Hiroyoshi Takao, Takatsuki; Masaaki Hirooka, Ibaraki, and Teruo Oshima, Nishinomiya, all of Japan, assignors to Sumitomo Chemical Company Limited, Osaka, Japan

Filed July 23, 1969, Ser. No. 844,187
Claims priority, application Japan, July 30, 1968, 43/53815
Int. Cl. C08f *15/40, 19/00, 15/04*
U.S. Cl. 260—80.78 28 Claims

Ethylene, propylene and similar olefins, with or without a conjugated or non-conjugated polyene (e.g., isoprene, 1,4-hexadiene, 5-ethylidene-2-norbornene) are copolymerized in solution with a catalyst based on organoaluminum compound (e.g., ethylaluminum sesquichloride) and vanadyl compound of the type $VO(OR_m)X_{3-m}$ where R is cyclic hydrocarbon, X is halogen and m is 1 to 3 (e.g., vanadyl tricyclohexoide, monovanadyl dicyclohexoxide, dichlorovanadyl bornyloxide, monochlorovanadyl dinorbornyloxide). Use of a vanadyl compound having a cyclic hydrocarbon substituent provides a catalyst having enhanced ability to incorporate diene, including conjugated diene, into the copolymer.

3,674,756

COPOLYMERIZATION OF ALLYL FLUORIDE

Jacques Abraham Waterman; Ilan Shaham, and Leonard M. Shorr, all of Haifa, Israel, assignors to Israel Mining Industries-Institute for Research and Development, Haifa Bay (near Ir Ganim) Haifa, Israel

Filed Dec. 20, 1968, Ser. No. 786,549
Claims priority, application Israel, Feb. 1, 1968, 29406
Int. Cl. C08f *1/60, 15/06, 15/24*
U.S. Cl. 260—80.81 3 Claims

Copolymerization of allyl fluoride at a temperature not exceeding 55° C in the presence of a catalyst of the free radical donor type.

3,674,757

OLEFIN EXTRUSION COMPOSITIONS AND METHOD OF PREPARING SAME

Melville W. Uffner, Media, Pa., assignor to Air Products and Chemicals, Inc., Philadelphia, Pa.

Filed July 17, 1970, Ser. No. 55,990
Int. Cl. C08f *29/04*
U.S. Cl. 260—86.7 9 Claims

A fluorochemical, perfluorocyclohexanoyl glycine, is blended at low concentrations with olefin polymers to obtain an extrudable composition having advantageous repellency characteristics.

3,674,758

STABILIZED TETRAFLUOROETHYLENE-FLUOROOLEFIN COPOLYMERS HAVING METHYL ESTER END-GROUPS AND PROCESS FOR PRODUCING SAME

Dana Peter Carlson, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed April 1, 1968, Ser. No. 717,926
Int. Cl. C08f *15/06*
U.S. Cl. 260—87.5 A 5 Claims

Stabilized tetrafluoroethylene-fluoroolefin copolymers having methyl ester end-groups are produced from tetrafluoroethylene-fluoroolefin copolymers having carboxylic acid end-groups and acid fluoride end-groups by contacting the polymer with methanol at from about 65–200° C. for the carboxylic acid end-groups and from about 0–200° C. for the acid fluoride end-groups and then drying the stabilized polymer.

3,674,759

PROCESS OF POLYMERIZING CONJUGATED DIENES AND CATALYST

Takeshi Yamawaki; Masakatsu Usami; Tetsumi Suzuki, and Takao Uematsu, all of Tokyo-to, Japan, assignors to Mitsubishi Kasei Kogyo Kabushiki Kaisha, Tokyo-to, Japan

Filed March 10, 1970, Ser. No. 18,338
Claims priority, application Japan, March 20, 1969, 44/21390
Int. Cl. C08d *1/14, 3/04, 3/06*
U.S. Cl. 260—82.1 19 Claims

In polymerizing a conjugated diene use is made of a catalyst consisting of tetrafluoroborate of nickel or cobalt or a complex compound of the tetrafluoroborate and an organometallic compound of a metal of group 2 or 3 of the periodic table.

3,674,760

METHOD OF PRODUCING BUTADIENE-STYRENE COPOLYMER

Adel F. Halasa, Bath, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Sept. 2, 1970, Ser. No. 69,173
Int. Cl. C08f *19/08, 1/28;* C08d *1/32*
U.S. Cl. 260—83.7 5 Claims

Random butadiene-styrene copolymer is formed in solution with alkyllithium as catalyst and at least 4 parts of lithium alkoxide per part of alkyllithium as modifier. The copolymer is free of block styrene and has a vinyl content of 10–25 percent by weight.

3,674,761

METHOD FOR THE PREPARATION OF ETHYLENE-CARBOXYLIC ACID COPOLYMERS

Harry D. Anspon, Sewickley, Pa.; Bert H. Clampitt, and Ronald E. Gilbert, both of Overland Park, Kans., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 694,046, Dec. 28, 1967, abandoned. This application Sept. 9, 1970, Ser. No. 70,899
Int. Cl. C08f *15/02*
U.S. Cl. 260—87.3 6 Claims

An ethylene-carboxylic acid copolymer is prepared by the thermal decomposition of an ethylene-isopropyl ester of acrylic or methacrylic acid in the presence of controlled concentrations of water vapor or ammonia.

3,674,762
METHOD FOR PREPARING POLYTETRAFLUOROETHYLENE MOLDING POWDER

Masanori Izumo, and Tatsushiro Yoshimura, both of Osaka-fu, Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

Filed July 17, 1970, Ser. No. 55,962
Claims priority, application Japan, July 18, 1969, 44/57254
Int. Cl. C08f 3/24, 15/06
U.S. Cl. 260—87.5 6 Claims

Preparation of a free-flowing polytetrafluoroethylene molding powder by mechanically agitating polytetrafluoroethylene powder under a reduced pressure less than 500 mmHg (absolute). The obtained granular powder has good flowability, extremely little aggregates and high bulk density.

3,674,763
PROCESS FOR CURING FLUOROELASTOMER

Naoya Nakamura, and Miyata Yasuo, both of Osaka, Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

Filed Dec. 28, 1970, Ser. No. 102,189
Claims priority, application Japan, Dec. 30, 1969, 44/1836
Int. Cl. C08f 15/06, 15/40, 27/08
U.S. Cl. 260—87.7 11 Claims

A process for curing fluoroelastomer by curing a fluoroelastomer on heating in the presence of both N,N'-dicinnamylidene-1,6-hexylenediamine and para-phenylenediamine as a curing agent. By the use of both N,N'-cinnamylidene-1,6-hexylenediamine and para-phenylenediamine can give an extremely faster curing velocity than that in case of using each alone.

3,674,764
PROCESS FOR THE POLYMERIZATION OF OLEFINS

Koichiro Iwasaki; Kazuo Yamaguchi; Harutaka Kimura; Masayoshi Hasuo, all of Tokyo, and Toru Tanaka, Kawaski, all of Japan, assignors to Mitsubishi Chemical Industries Limited

Continuation of Ser. No. 824,264, May 13, 1969, abandoned. This application June 4, 1971, Ser. No. 150,243
Claims priority, application Japan, May 16, 1968, 43/32761
Int. Cl. C08f 1/42, 1/56, 15/04
U.S. Cl. 260—88.2 R 14 Claims

The catalyst used in the process of the present invention is prepared by reacting a heat-resistant metal oxide with a titanium halide to form a reaction product. The reaction product is hydrolized, dried and then reacted with an organoaluminum compound. The unreacted organoaluminum compound is then removed.

3,674,765
PROCESS FOR POLYMERIZING ALPHA-OLEFINS

Edward H. Carter, Jr.; Vernon K. Park, and Horst K. Seeger, all of Longview, Tex., assignors to Eastman Kodak Company, Rochester, N.J.

Filed Nov. 20, 1970, Ser. No. 91,592
Int. Cl. C08f 1/56, 3/10
U.S. Cl. 260—88.2 7 Claims

This invention relates to an improved catalyst composition, method of making same, and a process for polymerizing α-olefins using the catalyst composition. A transition metal halide catalyst, such as titanium chloride, wherein said transition metal has a valance at least one less than maximum, is pretreated with free lithium metal at elevated temperatures. The treated transition metal halide is then combined with a co-catalyst, such as lithium aluminum hydride, to prepare the catalyst mixture which can then be utilized to polymerize α-monoolefins.

3,674,766
POLYMERIZATION OF ETHYLENE AND CATALYSTS THEREFOR

Edward H. Mottus, Ballwin, Mo., and Morris R. Ort, Seabrook, Tex., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 671,952, Oct. 2, 1967, abandoned. This application Sept. 16, 1968, Ser. No. 763,485
Int. Cl. C08f 1/32, 3/06
U.S. Cl. 260—88.2 23 Claims

Catalysts useful for making ethylene polymers by polymerizing ethylene alone or with a comonomer in the presence of hydrogen are described. They consist essentially of a mixture of (1) a bromo and/or ioda aluminum compound, preferably of the formula

$$X_2AlCH_2(A'lCH_2)_pAlX_2$$

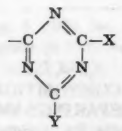
wherein X is a halogen atom with at least one X being a bromine or iodine atom or a mixture of such compounds with each other and p is O or 1 and (2) a compound of a transition metal of Groups III–B, IV–B, V–B, VI–B, VII–B, VIII or 1–B of the Periodic Table, preferably vanadium. The combined bromine or iodine renders the catalyst composition more sensitive to hydrogen employed for molecular weight control so that the ethylene polymers which are obtained at a given hydrogen partial pressure have a higher melt index than those which are obtained with the same type of organo-aluminum compound which does not contain the specified bromine or iodine constituent. The polymerization can be carried out in the presence of an inert solvent such as hexane, or a halogenated compound such as dichloromethane or dibromomethane, at a pressure from about 2 to about 10 atmospheres and employing an electron-donating compound such as t-butanol or water to modify the catalyst.

3,674,767
NOVEL POLYMERIC MATERIALS CONTAINING TRIAZINYL GROUPS

Malcolm Douglas Lilly; Garth Kay; Richard John Hugh Wilson, and Allister Kimball Sharp, all of London, England, assignors to National Research Development Corporation, London, England

Filed July 5, 1968, Ser. No. 742,612
Claims priority, application Great Britain, July 14, 1967, 32,541/67; Feb. 12, 1968, 6,869/68; April 10, 1968, 17,322/68
Int. Cl. C08f 27/08
U.S. Cl. 260—89.1 18 Claims

A polymer that is substituted by pendant triazinyl groups of the formula:



where X represents a radical capable of reacting with a biologically active substance, and Y represents a halogen atom, or a nucleophilic group that is an amino group, or an aliphatic or aromatic group, and also by a further substituent group which has a positive charge when the polymer is in contact with a solution having a pH in the normal biological range.

3,674,768

MODIFIED POLYALCOHOL

Keith George Allum, 28 Coppice Green, Bracknell, and Ronald David Hancock, 19 Netherby Park, Weybridge, both of England

Filed Jan. 12, 1970, Ser. No. 2,398
Claims priority, application Great Britain, Dec. 30, 1969, 5,193/69
Int. Cl. C08f 27/04
U.S. Cl. 260—91.3 VA 10 Claims

Transition metal-containing catalysts are prepared by reacting a transition metal compound with a polymer containing trivalent phosphorus and hydroxyl groups. The phosphorus-containing polymer is prepared by reacting a polymer containing hydroxyl groups such as polyvinyl alcohol with a trivalent phosphorus compound such as phenyl dichlorophosphine. Preferred transition metals are the Group VIII metals. The catalysts are useful for hydroformylation, hydrogenation, oligomerization and carboxylation.

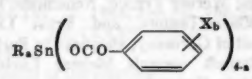
3,674,769

CRYSTALLINE PROPYLENE POLYMER COMPOSITIONS OF IMPROVED WORKABILITY

Reiichi Suzuki, Nishinomiya; Tadasu Tahara, Suita, and Hideo Mototani, Amagasaki, all of Japan, assignors to Nitto Kasei Co., Ltd., Osaka, Japan

Filed June 10, 1970, Ser. No. 45,260
Claims priority, application Japan, June 17, 1969, 44/48203
Int. Cl. C08f 29/02, 45/34, 45/40
U.S. Cl. 260—93.7 26 Claims

A plastic composition of improved workability comprises substantially crystalline propylene polymer, and an additive combination consisting of (a) an organotin benzoate derivative having the formula



wherein R is a saturated or unsaturated hydrocarbon radical of one to 12 carbon atoms, X is hydrogen, halogen, lower alkyl, hydroxyl or alkoxyl, and *a* and *b* are 1–3, and (b) a phenolic compound.

3,674,770

HIGH POTENCY THYROIDALLY ACTIVE MATERIALS PREPARED BY PARTIAL ACID HYDROLYSIS OF IODINATED PROTEIN

Richard D. Hoover, Lee's Summit, Mo., and George O. Kohler, El Cerrito, Calif., assignors to Agri-Tech, Inc., Kansas City, Mo.

Continuation-in-part of Ser. No. 584,119, Oct. 4, 1966, abandoned. This application March 24, 1971, Ser. No. 127,789
Int. Cl. A61k 17/10; C07g 7/00, 15/00
U.S. Cl. 260—119 8 Claims

A process for obtaining thyroidally active material of increased biological activity wherein thyroactive iodinated protein is subjected to partial hydrolysis with acid until about 70 to 95% of the NH_2-nitrogen obtainable on complete acid hydrolysis is liberated.

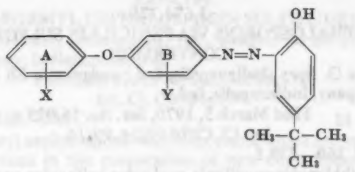
3,674,771

PHENYL-AZO-PHENOL DYESTUFFS

Edgar Siegel, Leverkusen, Germany, assignor to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Filed March 13, 1970, Ser. No. 19,460
Claims priority, application Germany, March 20, 1969, P 19 14 060.4
Int. Cl. C07c 107/06; C09b 29/12
U.S. Cl. 260—206 1 Claim

Water-soluble monoazo dyestuffs of general formula



wherein one of the residues X or Y in each case denotes a sulpho group and the other denotes hydrogen, and wherein the benzene nuclei A and B can be substituted by chlorine or alkyl groups with one to four C atoms as well as their preparation and their use for dyeing polyamide fibers in a neutral to weakly acid medium.

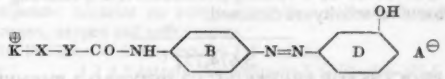
3,674,772

BASIC PHENYLAZOPHENYL DYES CONTAINING A QUATERNIZED AMINOALKYLENECARBOXAMIDE

Roland Entschel, and Willy Steinemann, both of Basel, Switzerland, assignors to Sandoz Ltd. (a/k/a Sandoz A.G.), Basle, Switzerland

Filed July 8, 1968, Ser. No. 743,037
Claims priority, application Switzerland, July 25, 1967, 10548/67; Aug. 29, 1967, 12125/67
Int. Cl. C09b 29/26, 43/12; D06p 3/26
U.S. Cl. 260—207 11 Claims

Basic monoazo dyes of the formula



wherein X stands for an alkylene radical,
Y for the direct linkage or an arylene radical,
$\overset{\oplus}{K}$ for an ammonium or a hydrazinium group
and $A^{\ominus}$ for an anion and wherein the aromatic ring
B contains at least one substituent and the aromatic ring D may bear further substituents, are useful for dyeing polyacrylonitrile and acrylonitrile copolymer fibers. Very level and pH-stable dyeings with very good light and wet fastness are thus obtained.

3,674,773

ERYTHROMYCIN DERIVATIVES

Paul Kurath, Waukegan, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Filed Oct. 6, 1970, Ser. No. 78,633
Int. Cl. C07c 47/18
U.S. Cl. 260—210 E 5 Claims

The 8,9-anhydro-8,9-epoxyerythromycin 6,9-hemiketal, the 8,9-seco-8-oxoerythromycin-9-oic acid 6,9-lactone, and the 8-hydroxyerythromycin derivatives of both erythromycin A and B have antimicrobial activity, and the N-oxide intermediates thereof.

3,674,774
PYRAZOMYCIN AND PROCESS FOR PRODUCTION THEREOF

Robert H. Williams, and Marvin M. Hoehn, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed April 23, 1969, Ser. No. 818,676
Int. Cl. C07d *51/52*
U.S. Cl. 260—210 AB **1 Claim**

Pyrazomycin is a new antibiotic produced by the fermentation of Streptomyces candidus NRRL 3601, having antiviral and antifungal activity.

3,674,775
CEPHALOSPORINS VIA PENICILLIN SULFOXIDE CONVERSION

Douglas O. Spry, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed March 5, 1970, Ser. No. 16,929
Int. Cl. C07d *99/24, 99/16*
U.S. Cl. 260—239.1 **8 Claims**

6-phthalimidopenicillanic acid ester sulfoxides and a C_2-C_5 acid anhydride heated in acidic medium afford 2β-alkanoyloxymethyl-2α-methyl- and 2α-alkanoyloxymethyl-2α-methyl- and 20α-alkanoyloxymethyl-2α-methyl-6-phthalimidopenicillanic acid esters, which on oxidation form separable α-sulfoxides. 2β-Alkanoyloxymethyl-2α-methyl-6-phthalimidopenicillanic acid ester α-sulfoxides heated in acidic medium provide 3-alkanoyloxymethyl-7-phthalimido-Δ^3-cephem-4-carboxylates and 3-alkanoyloxymethyl-3-hydroxy-7-phthalimidocepham-4-carboxylates readily converted to known cephalosporin antibiotics.

3,674,776
P-HYDROXYAMPICILLIN AND SALTS THEREOF

Anthony Alfred Walter Long, Reigate, Surrey, and John Herbert Charles Nayler, Dorking, Surrey, both of England, assignors to Beecham Group Limited, Brentford, Middlesex, England

Filed Aug. 18, 1969, Ser. No. 851,062
Claims priority, application Great Britain, Aug. 23, 1968, 40,319/68
Int. Cl. C07d *99/16*
U.S. Cl. 260—239.1 **5 Claims**

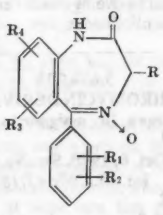
Derivatives of 6-Aminopenicillanic Acid possessing antibacterial activity are disclosed.

3,674,777
PROCESS FOR PREPARING 1,3-DIHYDRO-5-PHENYL-2H-1,4-BENZODIAZEPINE-2-THIONES

Jackson B. Hester, Jr., Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

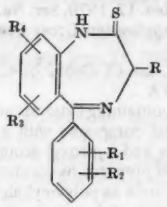
Filed Feb. 9, 1917, Ser. No. 114,047
Int. Cl. C07d *53/06*
U.S. Cl. 260—239.3 D **5 Claims**

A process to convert 5-phenylbenzodiazepine 4-oxides of the formula I:



I

wherein R is selected from hydrogen and alkyl of one to three carbon atoms, inclusive; and wherein R_1, R_2, R_3, and R_4 are selected from hydrogen, chloro, bromo, iodo, alkyl of one to three carbon atoms, inclusive, alkoxy of one to three carbon atoms, inclusive, nitro, trifluoromethyl, cyano, alkylthio, alkylsulfinyl, alkylsulfonyl, alkanoylamino and dialkylamino in which the carbon moieties are of one to three carbon atoms, inclusive, with phosphorus pentasulfide to the thione II



II

where R, R_1, R_2, R_3, and R_4 are defined as above. The thus obtained thions 11 can be used as described in U.S. Pat. No. 3,422,091 issued Jan. 14, 1969, as anticonvulsants, sedatives and muscle relaxants and also as intermediates in the preparation, of other know compounds having these same uses.

3,674,778
PREPARATION OF 9,11-DICHLORO STEROIDS

Lewis J. Throop, Los Altos, Calif., assignor to Syntex Corporation, Panama, Panama

Filed Feb. 16, 1970, Ser. No. 11,877
Int. Cl. C07c *173/00*
U.S. Cl. 260—239.55 D **10 Claims**

A process for preparing 9,11-dichloro steroids which involves the step of treating a 9α-unsubstituted-11β-hydroxy steroid with sulfuryl chloride optionally in inert liquid reaction media containing a tertiary amine. The 9,11-dichloro steroid products are known, useful anti-inflammatory agents.

3,674,779
4-CHLORO-3-OXO-14-HYDROXY-OR 4-CHLORO-3,14-DIHYDROXY-CARDA-4,20-DIENOLIDES AND PROCESS FOR THEIR MANUFACTURE

Ulrich Stache, Hofheim/Taunus; Kurt Radscheit, Kelkheim/Taunus; Werner Fritsch, Neuenhain/Taunus; Werner Haede, Hofheim/Taunus, and Ernst Lindner, Frankfurt/Main, all of Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt/Main, Germany

Filed May 8, 1970, Ser. No. 35,895
Claims priority, application Germany, May 14, 1969, P 19 24 801.2
Int. Cl. C07c *173/02*
U.S. Cl. 260—239.57 **4 Claims**

Process for the manufacture of 4-chloro-3-oxo-14β-hydroxy- or 4-chloro-3,14β-dihydroxy-carda-4,20(22)dienolides wherein 3-oxo-carda-4,14,20(22)-trienolides are at first treated with chlorine, the compounds obtained are converted by hydrogenolysis into 3-oxo-4-chloro-carda-4,14,20-trienolides, these are treated with N-bromo-acid amides, and the 3-oxo-4-chloro-14β-hydroxy-15α-bromo-carda-4,20(22)-dienolides thus obtained are treated with Raney nickel and may be reduced.

3,674,780
NOVEL 2,5-DISUBSTITUTED THIAZOLE CARBOXALDEHYDE AND DERIVATIVES OF THE SAME

Gerald Berkelhammer, Princeton; Goro Asato, Titusville, both of N.J., and Edward Leslie Moon, St. Petersburg, Fla., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 598,209, Dec. 1, 1966, Pat. No. 3,505,346, which is a continuation-in-part of Ser. No. 515,442, Dec. 21, 1965, abandoned. This application Jan. 19, 1970, Ser. No. 4,049
Int. Cl. C07d *91/32*
U.S. Cl. 260—240 G **4 Claims**

The present invention relates to novel 2,5-disubstituted

mononitro thiazoles and to methods for their preparation. These compounds are used for controlling or inhibiting the growth of microorganisms, fungi and nematodes.

3,674,781
OPTICAL BRIGHTENERS OF THE BENZOXAZOLE SERIES

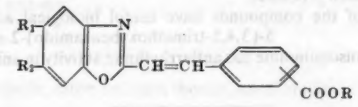
Erich Schinzel, Frankfurt am Main; Ulrich Pintschovius, Kelkheim am Taunus, and Karl Heinz Lebkucher, Hofheim am Taunus, all of Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt/Main, Germany

Continuation-in-part of Ser. No. 366,901, May 21, 1964, abandoned, Continuation of Ser. No. 624,721, March 21, 1967, abandoned. This application Sept. 15, 1970, Ser. No. 72,492

Int. Cl. C07d *85/48*; C09b *23/14*

U.S. Cl. 260—240 D **3 Claims**

Colorless or nearly colorless fluorescent benzoxazole compounds which correspond to the general formula



may be used as optical brighteners. In the above formula I, the radical R represents hydrogen, alkyl of one to four carbon atoms, cyclohexyl, halo lower alkyl, hydroxyethyl, lower alkoxy lower alkyl, di-(lower alkyl)-amino lower alkyl, tri-(lower alkyl)-amonium lower alkyl, phenyl and phenyl lower alkyl, and R_1 stands for hydrogen, lower alkyl or halogen, R_2 stands for lower alkyl.

3,674,782
INTERMEDIATES AND THE PREPARATION AND USE THEREOF

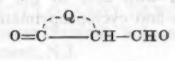
Carl H. Eldredge, and John D. Mee, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 24, 1968, Ser. No. 786,759

Int. Cl. C09b *23/10*

U.S. Cl. 260—240.4 **3 Claims**

Novel compounds of the formula:



are provided wherein Q represents the non-metallic atoms required to complete an acidic nucleus of the type used in merocyanine dyes. Methods for preparing these compounds, and the preparation of merocyanine and oxonol dyes employing these compounds, are also described.

3,674,783
PHTHALOCYANINE COMPOUNDS

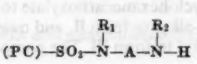
Hans Von Tobel, Riehen, Basel, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Filed June 16, 1969, Ser. No. 833,732

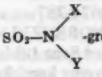
Int. Cl. C07d *55/20, 27/74*

U.S. Cl. 260—242 **11 Claims**

Watersoluble condensation products of 2 Moles of a compound or two different compounds of the formula



wherein PC stands for a metal-free or metal-containing phthalocyanine radical bearing two or three SO_3H— and/or



A for an organic bridge-member, each of R_1 and R_2 for hydrogen or lower (substituted) alkyl, each of X and Y for hydrogen or lower (hydroxy) alkyl, with 1 Mol of cyanuric halide, as dyes with good wash-off and build-up properties, especially good for printing and exhaustion dyeing.

3,674,784
3-FORMYL CEPHALOSPORIN SULFOXIDES

J. Alan Webber, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed July 27, 1970, Ser. No. 58,678

Int. Cl. C07d *99/24*

U.S. Cl. 260—243 C **11 Claims**

3-Formyl cephalosporin sulfoxide esters which are useful as intermediates in the preparation of new cephalosporin antibiotics.

3,674,785
CERTAIN FLUORIMINO OR AZOMETHINE CONTAINING COMPOUNDS

Ronald A. Mitsch, Falcon Heights, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Jan. 9, 1964, Ser. No. 336,839

Int. Cl. C07d *93/10, 87/00, 29/14*

U.S. Cl. 260—243 R **12 Claims**

8. A compound of the formula:

wherein each R is selected from the class consisting of fluorine and fluoroalkyl radicals and wherein R groups taken together can form ring systems, which compound comprises a ring which contains a plurality of hetero atoms therein, said ring containing only a single azomethine group, provided that said compound contains no atoms other than carbon, fluorine, nitrogen, oxygen and sulfur atoms.

10. Perfluoro-5,6-dihydro-2H-1,4-oxazine.

12. 1,1,1,1-tetrafluoroperfluoro-5,6-dihydro-2H-1,4-thiazine.

3,674,786
NEW-6-AMINO-4-OXO-4,5-DIHYDRO-ISOTHIAZOLO[5,4-D]PYRIMIDINES

Srinivasachari Rajappa, Bombay, India, assignor to Ciba-Geigy Corporation, Summit, N.J.

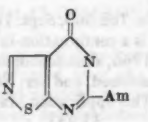
Filed Oct. 10, 1969, Ser. No. 865,477

Claims priority, application Switzerland, Oct. 17, 1968, 15560/68; Sept. 15, 1969, 13989/69

Int. Cl. C07d *87/46*

U.S. Cl. 260—247.1 **9 Claims**

Compounds of the formula



in which Am stands for optionally substituted amino, and which are substituted in 3-position and optionally substituted

in 5-position are useful as central depressant and hypnotic-sedative agents.

3,674,787

2-(α-MORPHOLINOBENZYL)-ANILIDES

Hans-Hasso Frey, Soborg, and Sven Liisberg, Vedbaek, both of Denmark, assignors to Lovens kemiske Fabrik Produktionsaktieselskab, Ballerup, Denmark

Filed March 10, 1969, Ser. No. 805,856

Claims priority, application Great Britain, March 14, 1968, 12,494/68

Int. Cl. C07d *87/42*

U.S. Cl. 260—247.2 A **9 Claims**

This invention relates to pharmaceutically active 2-(α-morpholinobenzyl)-anilides intended for use as tranquilizers having, e.g., an anticonvulsive, muscle-relaxing, or sedative effect, to salts of the said anilides, and to pharmaceutical preparations in dosage unit form, containing from 5 mg to 250 mg of the said anilides or salts per dose.

3,674,788

DIPYRIDYLIUM QUATERNARY DIHALIDE HALOGEN COMPLEXES

Robert M. Thomas; Fred R. Gerns, and John L. Sands, all of West Lafayette, Ind., assignors to Great Lakes Chemical Corporation, West Lafayette, Ind.

Continuation-in-part of Ser. No. 770,082, Oct. 23, 1968, Pat. No. 3,641,041. This application Jan. 15, 1971, Ser. No. 106,934

Int. Cl. C07d *51/02*

U.S. Cl. 260—250 R **5 Claims**

Halogen complexes of dipyridylium quaternary dihalides which are bacteriocidal and herbicidal agents and useful as defoliants and desiccants, particularly as cotton defoliant-desiccants.

This invention relates to novel quaternary dihalide halogen complexes, more particularly to halogen complexes of N,N′-ethylene-2,2′-dipyridylium dihalides and to their use as herbicides, especially for growing vegetation, which is substantially severely damaged or completely destroyed by herbicidal treatment therewith, and as defoliants and desiccants, particularly as superior harvest aid chemicals having special application in the preparation of cotton for harvest by defoliation and desiccation without concurrent suppression of the opening of mature bolls of cotton plants treated therewith.

3,674,789

TRICYCLOHEXYLTIN ESTERS

Donald E. Bubblitz, Concord, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 761,313, Sept. 20, 1968, Pat. No. 3,598,849. Filed July 28, 1970, Ser. No. 64,891

Int. Cl. C07d *105/00*

U.S. Cl. 260—270 **1 Claim**

Novel tricyclohexyltin esters wherein the ester moiety is selected from ferrocenylcarbonyloxy, pyridylcarbonyloxy, phenoxyacetoxy, chlorophenoxyacetoxy, and phenylthioacetoxy These compounds are useful as pesticides.

3,674,790

2,10-DISUBSTITUTED-1,2,3,4-TETRAHYDROBENZO[B]f[1,6]NAPHTHYRIDINES USEFUL AS CNS DEPRESSANTS

Milton Wolf, West Chester, and James L. Diebold, Havertown, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 760,063, Sept. 16, 1968, Pat. No. 3,580,915, which is a continuation-in-part of Ser. Nos. 533,802, March 14, 1966, abandoned, and Ser. No. 533,793, March 14, 1966, abandoned, and Ser. No. 581,756, Sept. 22, 1966, abandoned. This application May 1, 1970, Ser. No. 33,932

Int. Cl. C07d *39/00*

U.S. Cl. 260—286 R **43 Claims**

This invention concerns 1,2,3,4-tetrahydrobenzo[b][1,6]naphthyridines, 1,2,3,4,4a,5,10,10a-octahydrobenzo[b][1,6]naphthyridines and the pharmacologically acceptable acid addition salts thereof which are pharmacologically active as central nervous system depressants which are useful in producing a calming effect in warm-blooded animals. Further, this invention concerns a process for the preparation of 10-amino-1,2,3,4-tetrahydrobenzo[b][1,6]naphthyridines.

3,674,791

BENZAMIDO 2 LOWER ALKYL DECAHYDROISOQUINOLINES

Ian William Mathison, Memphis, Tenn., assignor to Marion Laboratories, Inc., Kansas City, Mo.

Filed March 26, 1968, Ser. No. 715,946

Int. Cl. C07d *35/38*

U.S. Cl. 260—287 R **5 Claims**

Disclosed are 5,6,7 or 8-benzamido isoquinolines, tetrahydroisoquinolines and decahydroisoquinolines, processes of producing these compounds and intermediates useful in such processes.

Some of the compounds have useful biological activity. Thus, 5-(3,4,5-trimethoxybenzamido)-2-methyl decahydroisoquinoline has antiarrhythmic activity in animals.

3,674,792

1-(BENZOHETEROCYCLIC CYCLOPROPYLMETHYL)-4-PHENYL-4-PIPERIDINOLS

Carl Kaiser, 1105 Sylvan Drive, Haddon Heights, N.J., and Charles L. Zirkle, 373 Beechwood Road, Berwyn, Pa.

Filed July 16, 1970, Ser. No. 62,763

Int. Cl. C07d *29/36*

U.S. Cl. 260—293.57 **10 Claims**

1-(Benzoheterocyclic cyclopropylmethyl)-4-phenyl-1,2,5,6-tetrahydropyridines in which the benzoheterocyclic moiety is 2- or 3-thianaphthenyl, benzofuryl or indolyl and said moiety and/or the phenyl groups may be substituted by chloro, bromo, fluoro, methyl, methoxy or trifluoromethyl have central nervous system depressant and neuroleptic activity. The compounds are generally prepared from a benzoheterocyclic cyclopropanecarboxylic acid via the acid chloride or the lower alkyl mixed anhydride by condensation with a 4-phenyl-4-piperidinol to give a corresponding amide. The amide is reduced to the cyclopropylmethyl derivative which is dehydrated with acid to the tetrahydropyridine product. The amides and cyclopropylmethyl derivatives are useful intermediates.

3,674,793

6-HYDROXY-2-AZABICYCLO[2.2.2]OCTAN-3-ONES AND 2-AZABICYCLO [2.2.2.]OCTANE-3,6-DIONES

Denis M. Bailey, East Breenbush, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Filed March 29, 1967, Ser. No. 626,679

Int. Cl. C07d *39/00*

U.S. Cl. 260—293.54 **7 Claims**

2-R-6-hydroxy-2-azabicyclo[2.2.2]octan-3-ones (I) and 2-R-2-azabicyclo-[2.2.2]octane-3,6-diones (II) where R is benzyl or lower-alkyl, 6-(lower-alkanoates) of 2-R-6-hydroxy-2-azabicyclo-[2.2.2]octan-3-ones where R is lower-alkyl (III) and preparation of said compounds by reacting a lower-alkyl trans-3,4-epoxycyclohexanecarboxylate with an amine of the formula $R—NH_2$ and heating the resulting lower-alkyl 3-hydroxy-4-RNH-cyclohexanecarboxylate to form I, esterifying I where R is lower-alkyl to form II, and oxidizing I where R is benzyl or lower-alkyl to form III. The compounds have stimulatory activity.

3,674,794

CERTAIN-3-PYRIDINE-SULFONAMIDE DERIVATIVES

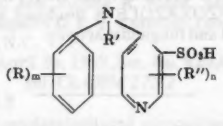
Renat Herbert Mizzoni, Long Valley, and Herbert Morton Blatter, Summit, both of N.J., assignors to Ciba-Geigy Corporation, Summit, N.J.

Continuation-in-part of Ser. No. 876,038, Nov. 12, 1969. This application March 18, 1970, Ser. No. 20,833

Int. Cl. C07d *31/50*

U.S. Cl. 260—294.8 F 3 Claims

New 4-arylamino-3-pyridinesulfonic acids, e.g. those of the formula



R=H, alkyl, free, esterified or etherified OH, CF_3, NO_2, amino, free of functionally converted carboxy or sulfo
R′=H, alkyl or acyl
R″=H or alkyl
m=1-3, n=1 or 2

the N-oxide, esters and salts thereof, are diuretics.

3,674,795

PYRIDYL XANTHATES

Joseph E. Dunbar, and John W. Zemba, both of Midland City, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Aug. 20, 1970, Ser. No. 65,741

Int. Cl. C07d *31/50*

U.S. Cl. 260—294.8 E 7 Claims

Novel pyridyl Xanthate compounds are prepared by the reaction of a polychloro-4-alkylsulfonyl pyridine or pentachloropyridine with an alkali metal salt of an alkylxanthic acid in the presence of an inert carrier as a reaction medium at a temperature of from bout 20° C. to about 95° C. The novel compounds are active as pesticides.

3,674,796

BASIC ETHERS OF 1-HYDROXYPHENYLBENZCYCLOALKANE-2-SPIROCYCLOALKYL DERIVATIVES

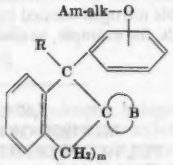
Lincoln Harvey Werner, Summit, N.J., assignor to Ciba-Geigy Corporation, Summit, N.J.

Filed Dec. 20, 1968, Ser. No. 785,785

Int. Cl. C07d *27/02*

U.S. Cl. 260—295.5 S 6 Claims

Basic ethers of 1-hydroxyphenyl-benzcycloalkane-2-spirocycloaliphatic compounds, e.g. those of the formula



alk=lower alkylene
Am=an amino group
R=H or OH
B=lower alkylene or alkenylene
m=1-3

acyl derivatives, salts and quaternaries thereof exhibit antiestrogenic effects.

3,674,797

PRODUCTION OF BIS-QUATERNARY SALTS OF 4:4′-BIPYRIDYLS

John Edward Colchester; John Gerard Carey, and Michael David Taylor, all of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Feb. 24, 1970, Ser. No. 13,801

Claims priority, application Great Britain, March 7, 1969, 12,175/69

Int. Cl. C07d *31/42, 31/42*

U.S. Cl. 260—295 AM 11 Claims

A process for the production of a 1,1′-disubstituted-4,4′-bipyridylium salt which comprises treating a 1,1′-disubstituted-1,1′,4,4′-tetrahydro-4,4′-bipyridyl with a 2-alkyl-9,10-anthraquinone, the 2-alkyl-9,10-anthraquinone being such that the corresponding 9,10-anthraquinol can be oxidized to the substituted 9,10-anthraquinone by oxygen and also being such that it is a hydrogen acceptor and has a redox potential in water more positive than −1.48 volts as compared with the saturated calomel electrode.

3,674,798

POLYFLUOROISOALKOXYALKYL PYRIDINIUM SALTS

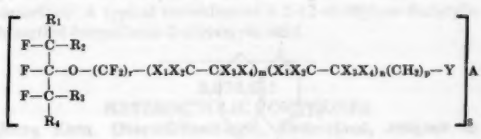
Alson K. Price, Eggertsville, and Bernard Sukornick, Williamsville, both of N.Y., assignors to Allied Chemical Corporation, New York, N.Y.

Filed Dec. 15, 1969, Ser. No. 885,328

Int. Cl. C07d *31/28*

U.S. Cl. 260—297 R 22 Claims

Compounds of the formula



wherein R_1–R_4 are fluorine, chlorine or perhaloalkyl groups; X_1–X_4 are hydrogen, halogen, or alkyl halide; Y is thiourea, pyridine, quinoline, or the alkyl or hydroxyalkyl derivatives thereof; A is an accompanying anionic moiety; r is an integer from 1-2, m and n are integers from 0-20, and s is an integer from 1 up to the total negative charge of A. These compounds are useful as surface active agents and for imparting water and oil repellent properties to various substrates such as textiles, leather and paper.

3,674,799

[4′-(PHENYL-3,6-DIHYDRO-1-(2H)-PYRIDYL]-2-HYDROXY PROPOXY-ANILIDES AND DERIVATIVES THEREOF

Albrecht Edenhofer, Riehen, and Hans Spiegelberg, Basel, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Dec. 4, 1969, Ser. No. 882,298

Claims priority, application Switzerland, Dec. 24, 1968, 19268/68

Int. Cl. C07d *31/50*

U.S. Cl. 260—294.8 F 15 Claims

Substituted [3-(4-phenyl-1-hydropyridyl)-propoxy or propyl-thio]anilines prepared, inter alia, by reacting the correspondingly substituted propoxy or propyl-thio anilines and N-phenyl-hydropyridines, are described. The end products, i.e., the substituted [3-(4-phenyl-1-hydropyridyl)-propoxy or propyl-thio]anilines are useful as antiphlogistic, antiallergic, antitussive and analgesic agents.

3,674,800
DERIVATIVES PYRIDINIUM OF POLYFLUOROISOALKOXYALKANAMIDES

Richard F. Sweeney, Randolph Township, Morris County; Aziz Urrehman Khan, Elizabeth; Alson K. Price, Morristown; Edward Stephen Jones, Whippany, and Julian A. Otto, Stockholm, all of N.J., assignors to Allied Chemical Corporation, New York, N.Y.

Filed April 14, 1969, Ser. No. 816,013
Int. Cl. C07d *31/44*
U.S. Cl. 260—295 AM 10 Claims

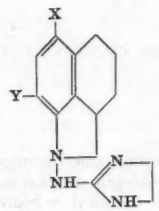
N-methylol and N-halomethyl derivatives of polyfluoroisoalkoxyalkanamides, and their substituted ammonium salts characterized in that an ether oxygen links a fluorinated carbon atom attached to two fluoroalkyl groups and at least one $-CF_2-$ group. These compounds are useful as water and oil repellency agents.

3,674,801
1,2,2A,3,4,5-HEXAHYDRO-1-(2-IMIDAZOLIN-2-YLAMINO)-BENZ[CD]INDOLES

Gerhard Bormann, Basel; John Gmunder, Muttenz/BL; Heinrich Wilkens, Brombach, and Franz Troxler, Bottmingen Basel-land, all of Switzerland, assignors to Sandoz Ltd., (also known as Sandoz AG), Basle, Switzerland

Filed Oct. 14, 1970, Ser. No. 80,748
Claims priority, application Switzerland, Oct. 24, 1969, 15858/69; July 6, 1970, 10182/70; July 6, 1970, 10183/70
Int. Cl. C07d *49/34*
U.S. Cl. 260—309.6 7 Claims

The present invention concerns compounds of the formula:



wherein

X is hydrogen, halogen, methyl or methylthio and
Y is hydrogen,

or

X is hydrogen and
Y is methyl,

or

both X and Y are chlorine.

The compounds and pharmaceutically acceptable acid addition salts thereof are vasoconstrictors.

3,674,802
2-ACYL-4-ACYLOXY-2,3,4,5-TETRAHYDRO-1,2,4-OXADIAZOLES

John E. Franz, Crestwood, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Jan. 5, 1970, Ser. No. 841
Int. Cl. C07d *85/52*
U.S. Cl. 260—307 F 5 Claims

2-Acyl-4-acyloxy-2,3,4,5-tetrahydro-1,2,4-oxadiazoles are described herein. These compounds find utility as herbicides. For example, 2-(parachlorobenzoyl)-2,3,4,5-tetrahydro-1,2,4-oxadiazole-4-yl-parachlorobenzoate and its herbicidal properties are disclosed herein.

3,674,803
2-0,0-DITHIOPHOSPHORYL-METHYL-BENZOXAZOLE

Otto Scherer, Bad Soden/Taunus, and Gerhard Stahler, Frankfurt/Main, both of Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt/Main, Germany

Continuation-in-part of Ser. No. 552,408, May 24, 1966, abandoned. This application July 16, 1969, Ser. No. 842,404
Claims priority, application Germany, June 9, 1965, F 46283; June 9, 1965, F 46284
Int. Cl. C07d *85/48*
U.S. Cl. 260—307 D 1 Claim

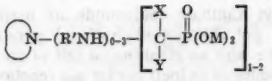
2-O,O-DIETHYL-DITHIOPHOSPHORYL-METHYL-5,7-DICHLOROBENZOXAZOLE is disclosed as having insecticidal, acaricidal and fungicidal activity.

3,674,804
IMIDAZOLINE PHOSPHONIC ACIDS

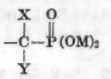
Derek Redmore, Ballwin, Mo., assignor to Petrolite Corporation, Wilmington, Del.

Filed Oct. 17, 1968, Ser. No. 768,509
Int. Cl. C07d *49/34*; C07f *9/38*
U.S. Cl. 260—309.6 5 Claims

Nitrogen-heterocyclic phosphonic acids and derivatives thereof characterized by aminomethyl (or substituted methyl) phosphonic acids or derivatives thereof bonded directly or indirectly, i.e., through a N-side chain to the nitrogen atom in the heterocyclic ring, for example those containing in the molecule at least one of the following units:



where represents a heterocyclic ring having a nitrogen atom on the ring; —R'N— represents an amino-terminated side chain attached directly to the ring nitrogen (which side chain may or may not be present); and



represents a methyl (or substituted methyl) phosphonic acid group where M is hydrogen, an alcohol or a salt moiety, and X and Y are hydrogen or a substituted group such as alkyl, aryl, etc., of which one or two units may be present depending on the available nitrogen bonded hydrogens, and to uses for these compounds, for example, as scale inhibitors, corrosion inhibitors, etc.

3,674,805
METHOD OF PREPARING POLY(COPPERPHTHALOCYANINE)

Richard V. Webb, and Donald C. Batesky, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sept. 2, 1969, Ser. No. 854,738
Int. Cl. C09b *17/04*
U.S. Cl. 260—314.5 R 8 Claims

Poly(copperphthalocyanine) is prepared by reaction of 1,2,4,5-tetrabromobenzene and cuprous cyanide in an N,N-di-

alkylamide, such as N,N-dimethylformamide or N,N-dimethylacetamide, which serves as both solvent and catalyst for the reaction. The reaction can be carried out at atmospheric pressure with temperature control provided by refluxing the reaction mixture so that it is well suited to use in commercial scale production.

3,674,806

1,3,3,4,4-PENTASUBSTITUTED PYRROLIDINES

Herbert J. Bluhm, and Eugene R. Fluck, both of Winston-Salem, N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed April 30, 1969, Ser. No. 820,620
Int. Cl. C07d 27/02
U.S. Cl. 260—326.8 5 Claims

Novel 1,3,3,4,4-pentasubstituted pyrrolidines having pharmacological activity.

3,674,807

1-P-(ω-AMINOALKYL)PHENYL-CYCLOHEXANES, CYCLOHEXENES AND CYCLOHEXANOLS

Mario G. Buzzolini, Morristown, N.J., assignor to Sandoz-Wander, Inc., Hanover, N.J.

Filed Aug. 15, 1969, Ser. No. 850,675
Int. Cl. C07d 27/04
U.S. Cl. 260—326.5 M 12 Claims

1-p-(ω-aminoalkyl)phenyl-substituted and unsubstituted cyclohexanes, cyclohexenes and cyclohexanols, e.g., 2-[4-(1-cyclohexen-1-yl)cyclohexyloxy]-N,N,-2-trimethyl-propylamine hydrochloride. The compounds are useful as hypolipidemic agents.

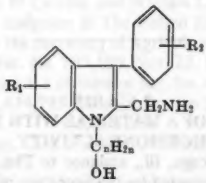
3,674,808

1-HYDROXYALKYL-2-AMINOMETHYL-INDOLE DERIVATIVES

Shigeho Inaba, Takarazuka; Mitsuhiro Akatsu, Ikeda, and Hisao Yamamoto, Nishinomiya, all of Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

Filed Sept. 8, 1970, Ser. No. 70,564
Int. Cl. C07d 27/56
U.S. Cl. 260—326.15 4 Claims

Novel 1-hydroxyalkyl-2-aminomethylindole derivatives represented by the formula.



wherein R_1 and R_2 each represents hydrogen, halogen, C_1-C_4-alkyl, trifluoromethyl or nitro, and n represents an integer of 1 to 4, or salts thereof, and a process for producing thereof.

The 1-hydroxyalkyl-2-aminomethylindole derivatives are very useful intermediates for producing 1-hydroxyalkyl-1,4-benzodiazepin-2-one derivatives having prominent effects as tranquillizers, muscle relaxants, antispasmodics, anticonvalsants and hypnotics.

1-Hydroxyalkyl-1,4-benzodiazepin-2-one derivatives are prepared by oxidizing the 1-hydroxyalkyl-2-aminomethylindole.

3,674,809

N-(2-FLUOROETHYL)-N-[2-(3-INDOLE)ETHYL] AMINES

Zinon B. Papanastassiou, Lexington, and John L. Neumeyer, Wayland, both of Mass., assignors to Arthur D. Little Inc., Cambridge, Mass.

Division of Ser. No. 728,818, May 13, 1968, Pat. No. 3,591,603. This application July 30, 1970, Ser. No. 64,897
Int. Cl. C07d 27/56
U.S. Cl. 260—326.15 2 Claims

New 3-indoleglyoxamides and (3-indole)-lower-alkylamines having useful C.N.S. depressant activity and prepared, respectively, by reaction of a 3-indoleglyoxalyl halide or a (3-indole)-lower-alkyl halide with an appropriate amine.

3,674,810

4-CHLORO-5-(2-METHYLENE-BUTYRYL)-BENZO(6)THIOPHENE-2-CARBOXYLIC ACIDS

Janos Zergenyi, Riehen, and Ernst Habicht, Oberwil, both of Switzerland, assignors to Geigy Chemical Corporation, Ardsley, N.Y.

Division of Ser. No. 746,262, July 22, 1968, Pat. No. 3,580,931. This application Aug. 19, 1970, Ser. No. 65,342
Int. Cl. A61k 27/00; C07d 63/22
U.S. Cl. 260—330.5 1 Claim

The production of 5-(2-methylene-alkanoyl)-benzofuran-, 5-(2-methylene-alkanoyl)-indole- and 5-(2-methylene-alkanoyl)-benzo[b]thiophene-2-carboxylic acids by reaction of the corresponding 5-(2-dimethylaminomethyl-alkanoyl)-derivatives with sodium acetate in the glacial acetic acid and their pharmaceutically acceptable salts with bases, a method of producing a diuretic and saluretic effect in mammals comprising administering said compounds to said mammals and pharmaceutical compositions containing said compounds are described. A typical embodiment is 5-(2-methylene-butyryl)-6-methyl-benzofuran-2-carboxylic acid.

3,674,811

HETEROCYCLIC COMPOUNDS

Joerg Kern, Oberwil/Basel-land, Switzerland, assignor to CIBA-GEIGY Corporation, Basel, Switzerland

Filed Oct. 22, 1969, Ser. No. 868,590
Claims priority, application Switzerland, Nov. 1, 1968, 16332/68
Int. Cl. C07d 87/54
U.S. Cl. 260—338 3 Claims

Heterocyclic compounds containing a hetero-ring with eight ring members, namely N,N'-substituted 2,5-dioxa-3,7-diazacyclooctanes are provided. These compounds are manufactured by eliminating water from the N,N-dimethylol compounds or the mixtures for the formation of these N,N-dimethylol compounds from formaldehyde and the corresponding amides or carbamic acid esters. The heterocyclic compounds are suitable as finishing agents for cellulose-containing materials, e.g., for creaseproofing, softening, hydrophobizing or oleophobizing textiles. Furthermore they may be useful as flameproofing or antimicrobical agents, or as intermediates in the manufacture of various products.

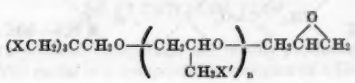
3,674,812

HALOGENATED EPOXIDES

Carl L. Gibbons, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Sept. 21, 1970, Ser. No. 74,205
Int. Cl. C07d 1/18
U.S. Cl. 260—348 R 7 Claims

Trihaloneopentyl alcohol is reacted with epihalohydrin and then with base to give an adduct of the formula



where each X and X′ is independently Br or Cl and *n* is an integer of 0 to about 10.

Such compounds are useful as plasticizers for polyvinyl chloride, as fire retardants for polyesters, and as intermediates.

3,674,813

METHOD OF PRODUCING PROPYLENE OXIDE, PROPYLENEGLYCOL AND ITS ESTERS

Erna Albertovna Bljumberg, Leninsky prospekt, 57, kv. 10; Alexandr Vasilievich Bobolev, Leninsky prospekt, 30, kv. 104; Svetlana Pavlovna Boboleva, Leninsky prospekt, 30, kv. 104, and Nikolai Markovich Emanuel, Vorobievskoe shosse, 26, kv. 44, all of Moscow, U.S.S.R.

Filed June 19, 1967, Ser. No. 647,250

Claims priority, application U.S.S.R., June 20, 1966, 1085374; June 20, 1966, 1096534

Int. Cl. C07d *1/12, 1/08, 31/20, 27/12*

U.S. Cl. 260—348.5 **8 Claims**

Propylene oxide, propylene glycol and esters thereof are produced by oxidizing propylene with an oxygen containing gas in an inert solvent at a temperature of at least 120° C. and a pressure of 50 to 10 atm in the presence of fluorine containing catalysts.

3,674,814

PREPARATION OF DIHYDROTEREPHTHALATES

Gerald Richard Aldridge, Elizabeth; Felix Frederick Ehrich, Westfield, and William Scott Struve, Chatham, all of N.J., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 19, 1970, Ser. No. 4,115

Int. Cl. C07c *49/64*

U.S. Cl. 260—396 N **7 Claims**

A process for preparing a dialkyl 2,5-diarylamino-3,6-dihydroterephthalate by condensing an arylamine with a dialkyl succinylsuccinate in the presence of a salt formed from trifluoroacetic acid and a secondary or tertiary amine, as a catalyst. This results in improved yields and purity of products obtained by subsequent pyrolysis of the terephthalates.

3,674,815

UNSATURATED 22-GUANIDYL STEROIDS

Rainer Philippson, Bergkamen; Helmut Hauser, Dortmund; Heinz Gibian, Berlin; Emanuel Kaspar, Kamen, and Hans-Joachim Kessler, Berlin, all of Germany, assignors to Schering AG, Berlin, Germany

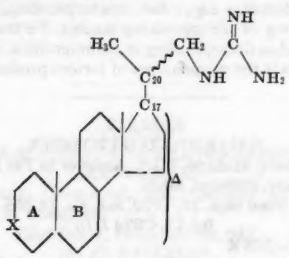
Filed April 30, 1970, Ser. No. 33,488

Claims priority, application Germany, April 30, 1969, P 19 22 457.8

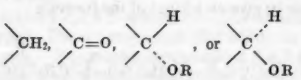
Int. Cl. C07c *169/38*

U.S. Cl. 260—397 **14 Claims**

22-Guanidyl steroids of the formula



wherein X is



in which R is a hydrogen atom or an acid residue and Δ represents a double bond present in at least one of rings A and B and between carbon atoms C_{17} and C_{20}, and the acid addition salts thereof, have anti-bacterial, anti-fungal and anti-trichomonadial activity.

3,674,816

ANNULENE STEROIDS, INTERMEDIATES, AND METHOD OF MAKING

John A. Edwards, Los Altos; John H. Fried, Palo Alto, and William McCrae, Los Altos, all of Calif., assignors to Syntex Corporation, Panama, Panama

Continuation-in-part of Ser. No. 714,078, March 18, 1968. This application Jan. 28, 1970, Ser. No. 14,571

Int. Cl. C07c *171/07, 169/20, 169/20*

U.S. Cl. 260—397.4 **25 Claims**

3-Keto-5,19-cyclo-androsta-1,7-diene and -1,6-diene steroids; 3-lower alkoxy-5,19-cyclo-5,10-secoandrosta-1(10),2,4,7-tetraene and -1(10),2,4,6-tetraene steroids; 3-carboxylic acyloxy-5,19-cyclo-5,10-seco-androsta-1(10),2,4,7-tetraene and -1(10),2,4,6-tetraene steroids; and 3-desoxy-5,19-cyclo-5,10-seco-androsta-1(10),2,4,7-tetraene and -1(10),2,4,6-tetraene steroids and methods of preparing these steroids and converting them to useful 5,10-sec-5,19-cycloandrosta-(10),2,4,6-pentaene steroids. The above compounds have utility as intermediates in the production of 5,10-sec-5,19-cycloandrosta-1(10),2,4,6-pentaene steroids which have utility in the treatment of conditions related to estrogen deficiencies and in the control and regulation of fertility.

3,674,817

NITRO-STEROIDS AND PROCESS FOR THEIR PREPARATION

Giuliana Baldratti; Alberto Consonni, and Roberto Sciaky, all of Milan, Italy, assignors to Societa Farmaceutici Italia, Milan, Italy

Filed June 8, 1970, Ser. No. 44,629

Claims priority, application Italy, June 11, 1969, 18045 A/69

Int. Cl. C07c *169/32*

U.S. Cl. 260—397.4 **16 Claims**

Some 7ξ-nitro-1,3,5(10)-estratrienes and a process for their preparation. The compounds inhibit gonatropin and ovulation both orally and parenterally.

3,674,818

SYNTHESIS OF A MATERIAL WITH JUVENILE HORMONE ACTIVITY

John H. Law, Chicago, Ill., assignor to The United States of America as represented by the Secretary of the Department of Health, Education and Welfare

Continuation of Ser. No. 626,677, March 29, 1967, abandoned. This application Dec. 5, 1969, Ser. No. 878,990

Int. Cl. C11c *3/00*

U.S. Cl. 260—408 **6 Claims**

Synthesis of a material with juvenile hormone activity by reacting crude or purified farnesoic acid with alcoholic hydrogen chloride wherein the alcohol is selected from the group consisting of ethanol, methanol, n-propanol and n-pentanol. Various comparisons are shown with other related compounds and an exemplary list of insects sensitive to the material is set forth.

3,674,819

PROCESS OF PREPARING ESTERS OF 3,7,11-TRIMETHYL-7,11-DICHLORO-2-DODECENE-1-OIC ACID

Miroslav Romanuk; Karel Slama, and Frantisek Sorm, all of Prague, Czechoslovakia, assignors to Ceskoslovenska Akademie Ved, Prague, Czechoslovakia

Filed April 30, 1969, Ser. No. 820,637
Claims priority, application Czechoslovakia, May 3, 1968, 3268/68
Int. Cl. C11c 3/00
U.S. Cl. 260—408 1 Claim

Process for the preparation of esters of 3,7,11-trimethyl-7,11-dichloro-2-dodecene-1-oic acid having the formula

(I)

wherein R is alkyl, cycloalkyl, aryl or aralkyl which comprises reacting farnesylic acid with hydrogen chloride in the presence of acetic acid to thereby form 3,7,11-trimethyl-7,11-dichloro-2-dodecene-1-oic acid having the formula

(II)

reacting said 3,7,11-trimethyl-7,11-dichloro-2-dodecene-1-oic acid with a chlorination agent to thereby form the corresponding chloride and converting the chloride to the ester by reaction with an alcohol for producing the desired ester.

The 3,7,11-trimethyl-7,11-dichloro-2-dodecene-1-oic acid is novel.

The esters can be employed to prevent the maturation of insects, i.e., larvae so treated do not attain adulthood.

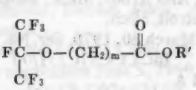
3,674,820

FLUORINATED ALCOHOLS AND THEIR ESTERS

Allen G. Pittman, El Cerrito, and William L. Wasley, Berkeley, both of Calif., assignors to The United States of America as represented by the Secretary of Agriculture

Division of Ser. No. 703,199, Nov. 22, 1967, Pat. No. 3,527,742, which is a division of Ser. No. 477,331, Aug. 4, 1965, Pat. No. 3,424,785. This application July 14, 1969, Ser. No. 841,616
Int. Cl. C07c 69/66; C11c 3/04
U.S. Cl. 260—408 4 Claims

Fluorinated ketones are converted into ether-esters, using the following typical plan: Hexafluoroacetone is reacted with an alkali metal fluoride, and the resultant intermediate is reacted with an omega-halo-aliphatic carboxylic acid ester, yielding



wherein *m* is 1–20, R′ is a hydrocarbon group.

3,674,821

PRODUCTION OF HIGH STABILITY LIQUID VEGETABLE OILS

Chester M. Gooding, Westfield, N.J., assignor to CPC International Inc.

Filed Jan. 5, 1971, Ser. No. 104,140
Int. Cl. C11c 3/12; C11b 7/00
U.S. Cl. 260—409 6 Claims

A process for obtaining a high stability liquid vegetable oil comprising partially hydrogenating a winterized vegetable oil having an iodine value of about 100 to 120 to an iodine value of about 70 to 90, cooling the oil and separating the solid components.

3,674,822

MONOMERIC AND POLYMERIC BIS (ARYL-OXYARYL) TIN COMPOUNDS

John R. Stemniski, Swampscott, Mass., assignor to Monsanto Research Corporation, St. Louis, Mo.

Filed Sept. 19, 1963, Ser. No. 310,129
Int. Cl. C07f 7/22
U.S. Cl. 260—429.7 3 Claims

This invention relates to disubstituted tin compounds of the formula $[R_1—Sn—R_2]n$ wherein each of R_1 and R_2 is a substituent selected from the class consisting of aryloxyaryl radicals containing from two to three benzene rings, wherein each said aryl radical is an aromatic hydrocarbon radical, and *n* is an integer with a value of at least 1. These compounds are useful as antioxidants for polyphenyl ether base fluids.

3,674,823

COMPOUND OF GERMANIC ACID AND CYSTEINE

Kazuo Makabe, Kamakura, Japan, assignor to Daiichi Yakuhin Sangyo Kabushiki Kaisha, Tokyo-to, Japan

Filed Feb. 20, 1970, Ser. No. 13,182
Claims priority, application Japan, April 2, 1969, 44/25338
Int. Cl. C07f 7/00; A61k 27/00
U.S. Cl. 260—429 R 2 Claims

Novel compound of germanic acid and cysteine which displays therapeutic effects for inflammatory diseases and water-eczema (caused by pompholyx trichophytia) and process for preparation thereof by the addition of cysteine to an aqueous solution of germanic acid which is obtained by dissolving germanium dioxide in heated water.

3,674,824

LONG CHAIN HYDROCARBON DITHIOCARBAMATE ACCELERATORS AND METHOD OF MAKING SAME

Roger W. Amidon, Oxford, and Richard A. Gencarelli, Cheshire, both of Conn., assignors to Uniroyal, Inc., New York, N.Y.

Filed Sept. 9, 1970, Ser. No. 70,935
Int. Cl. C07f 3/06, 3/08, 15/02
U.S. Cl. 260—429 K 35 Claims

Long chain hydrocarbon dithiocarbamate accelerators such as zinc N-dodecyl-N-isopropyldithiocarbamate useful in the sulfur cure of blends of EPDM with highly unsaturated rubbers such as SBR, NR, etc. In making the accelerators high speed agitation is employed in the salt-forming step to obtain small particle size salt substantially free from entrapped or occluded impurities.

3,674,825

HALO(ARYL)METAL COMPOUNDS AND METHOD OF PREPARATION

Peter S. Fitton, and Edward A. Rick, both of Charleston, W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed Sept. 30, 1969, Ser. No. 862,525
Int. Cl. C07f 15/00, 15/04
U.S. Cl. 260—429 R 22 Claims

Halo(aryl)metal compounds are readily produced when a Group VIII metal or a compound or complex of a Group VIII

metal is reacted with an aryl halide substituted with electron-withdrawing groups. The compounds have utility as catalysts for the oxidation of methyl benzenes and as intermediates in the arylation of olefins.

3,674,826

ANTIKNOCK TETRAMETHYL LEAD CONCENTRATE

Wallace L. Richardson, Lafayette; George J. Kautsky, El Cerrito, and Maurice R. Barusch, Richmond, all of Calif., assignors to Chevron Research Company

Filed July 11, 1960, Ser. No. 41,780
Int. Cl. C07f 7/24
U.S. Cl. 260—437 S 3 Claims

An antiknock concentrate consisting essentially of tetramethyl lead, halohydrocarbon scavenger and hydrocarbon liquid is disclosed.

3,674,827

PREPARATION OF AROMATIC ISOCYANATES

Velliyur Nott Padmanabha Rao, West Haven; John A. Scott, North Haven, and Benjamin M. Surowiecki, Jr., Meriden, all of Conn., assignors to Olin Mathieson Chemical Corporation

Filed Sept. 3, 1968, Ser. No. 757,105
Int. Cl. C07c 119/04
U.S. Cl. 260—453 PC 25 Claims

In the process for preparing an organic isocyanate by reacting an organic nitro compound with carbon monoxide in the presence of a catalyst, improved recovery of the organic isocyanate is obtained when the reaction is carried out in the presence of discrete particles of an oxide of iron. Further improvement in the recovery is also obtained when an oxide of molybdenum, an oxide of chromium, or mixture thereof is also added to the reaction mixture along with the oxide of iron.

3,674,828

PREPARATION OF LIQUID DIPHENYLMETHANE DIISOCYANATE COMPOSITIONS

Martin Frederick Brooks, and Vincent Kerrigan, both of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

Filed May 2, 1969, Ser. No. 821,457
Claims priority, application Great Britain, May 14, 1968, 22,884/68
Int. Cl. C07c 119/04
U.S. Cl. 260—453 P 6 Claims

A process for the manufacture of a liquid diphenylmethane diisocyanate composition which comprises heating at elevated temperature, a diphenylmethane diisocyanate which is solid or partially solid at 15° C., and a N,N′-disubstituted thiourea or N^1,N^4-disubstituted-bis-thiourea in an amount of from 0.25 to 20 percent by weight of the diphenylmethane diisocyanate and distilling out an isothiocyanate from the heated mixture.

3,674,829

CHLOROSULPHONYL VINYL ISOCYANATES AND A PROCESS FOR THEIR PRODUCTION

Dieter Arlt, Cologne-Buchheim, Germany, assignor to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Filed June 3, 1969, Ser. No. 830,113
Claims priority, application Germany, June 6, 1968, P 17 68 608.7
Int. Cl. C07c 119/04, 143/70
U.S. Cl. 260—453 AL 6 Claims

Chlorosulphonyl vinyl isocyanates are produced by reacting either an α-halogenated isocyanide dichloride or an α, β-unsaturated isocyanide dichloride with a halogen sulphonic acid. The chlorosulphonyl vinyl isocyanates produced are useful in the preparation of plant protection agents, dyestuffs and detergents and as monomers for the production of plastics.

3,674,830

PRODUCTION OF ALPHA-NAPHTHYL METHANESULFONATE ESTERS

Jorge R. Muratorio, Buenos Aires, Argentina, assignor to Celanese Corporation, New York, N.Y.

Filed Sept. 24, 1969, Ser. No. 860,838
Int. Cl. C07c 143/68
U.S. Cl. 260—456 P 2 Claims

Disclosed herein is a method of preparing alpha-naphthyl esters by the oxidation of naphthalene with bis-(methanesulfonyl peroxide). High ratios of the alpha to the beta-ester are prepared at high efficiencies and at reasonable temperatures by selecting certain solvents and by controlling certain other reaction variables. The alpha-naphthyl esters can be easily converted to alpha-naphthol.

3,674,831

PROCESS FOR PREPARATION OF METHYLCYCLOPENTANE AND METHYLCYCLOHEXANECARBOXYLIC ACIDS AND ESTERS

Leonard E. Rennick, Boothwyn, Pa., assignor to Sun Oil Company, Philadelphia, Pa.

Filed March 25, 1970, Ser. No. 22,677
Int. Cl. C07c 51/00
U.S. Cl. 260—468 CB 6 Claims

A process for the preparation of methylcyclopentane and methylcyclohexane carboxylic acids or esters by reacting methylcyclopentane or methylcyclohexane with carbon monoxide at a temperature of from about −10° to +10° C. in the presence of a mixture of fluosulfonic acid and antimony pentafluoride, and drowning the reaction mixture in water or an alkanol.

3,674,832

CYCLOPROPANE CARBOXYLIC ACID DERIVATIVES

Margaret H. Sherlock, Bloomfield, and Nathan Sperber, North Caldwell, both of N.J., assignors to Schering Corporation, Bloomfield, N.J.

Filed Aug. 22, 1968, Ser. No. 754,743
Int. Cl. C07c 63/42, 69/76
U.S. Cl. 260—469 9 Claims

Disclosed herein are 2-(p-substituted phenyl)-cyclopropane carboxylic acids, which compounds are useful in alleviating inflammation and pain.

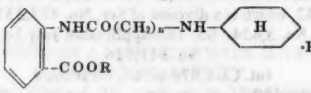
3,674,833

SALTS OF ETHYL O-(CYCLOHEXYLAMINO-ALKANOYLAMINO)-BENZOATE

Takeo Naito; Miyoshi Hirata, and Sumiro Isoda, all of Tokyo, Japan, assignors to Daiichi Seiyaku Co., Ltd., Tokyo, Japan

Filed Feb. 18, 1970, Ser. No. 12,424
Claims priority, application Japan, Feb. 21, 1969, 44/12593
Int. Cl. C07c 143/52
U.S. Cl. 260—470 5 Claims

Novel anthranilic derivatives represented by the formula:



wherein R, n, and X are as defined hereinafter, have been found to be especially effective anesthetic drugs for fish.

3,674,834

OXIMES OF 3,4-DIMETHOXYPHENYLPYRUVIC ACID ESTERS

Robert F. Parcell, Ann Arbor, Mich., assignor to Parke, Davis & Company, Detroit, Mich.

Filed March 30, 1970, Ser. No. 24,014
Int. Cl. C07c 131/00
U.S. Cl. 260—471 A 5 Claims

Oximes of 3,4-dimethoxyphenylpyruvic acid, lower alkyl esters, and their salts. These compounds can be produced by

reacting a 3,4-dimethoxybenzylmalonic acid, di- (lower alkyl) ester with a lower alkyl nitrite in the presence of a base. The oximes are then converted by reductive acetylation, selective hydrolysis of the lower alkyl ester group, and acidification to N-acetyl-3-(3,4-dimethoxyphenyl)alanine. The latter compound is converted to 3-(3,4-dimethoxyphenyl)-L-alanine by the enzymatic action of an acylase and then to 3-(3,4-dihydroxyphenyl)-L-alanine by cleavage of the ether groups.

3,674,835

PROCESS FOR THE PRODUCTION OF GLYCOL ESTERS OF CARBOXYLIC ACIDS

Gunther Boehmke, Leverkusen-Steinbuechel, Germany, assignor to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Feb. 14, 1968, Ser. No. 705,310

Claims priority, application Germany, Feb. 24, 1967, E 51628

Int. Cl. C07c *69/00*

U.S. Cl. 260—473 R **6 Claims**

The invention relates to a process for the production of glycol esters of carboxylic acids by reaction of a water-soluble alkylene oxide with an aqueous solution of an alkali metal or alkaline earth metal salt of a carboxylic acid at a pH value of from 6 to 10, the inorganic base liberated during the reaction being neutralized continuously.

3,674,836

2,2-DIMETHYL-ω-ARYLOXY-ALKANOIC ACIDS AND SALTS AND ESTERS THEREOF

Paul L. Creger, Ann Arbor, Mich., assignor to Parke, Davis & Company, Detroit, Mich.

Continuation-in-part of Ser. No. 730,946, May 21, 1968, abandoned. This application April 24, 1969, Ser. No. 819,126

Int. Cl. C07c *69/76*

U.S. Cl. 260—473 G **7 Claims**

A series of 2,2-dimethyl-ω-phenoxyalkanoic acids and 2,2-dimethyl-ω-(disubstituted phenoxy)alkanoic acids having 3 to 6 methylene groups between the phenoxy group or 0 phenoxy group and the carbon atom substituted by two methyl groups; and their salts and esters. The compounds reduce serum triglyceride levels and can be produced by (a) reacting an alkali metal derivative of an isobutyric acid, salt, or ester with a phenoxyalkyl halide or a disubstituted phenoxyalkyl halide; (b) esterifying a carboxylic acid; or (c) hydrolyzing a carboxylate ester.

3,674,837

POLYESTERS WHICH CONTAIN HYDROXYL AND CARBON AMIDE GROUPS

Wolf-Dieter Wirth, Cologne, Stammheim, and Erwin Muller, Leverkusen, both of Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Filed July 8, 1970, Ser. No. 53,280

Claims priority, application Germany, July 11, 1969, P 19 35 290.0

Int. Cl. C07c *101/26*

U.S. Cl. 260—482 R **8 Claims**

Polyesters which contain hydroxyl and carbonamide groups are prepared by copolymerizing a lactone with a lactam in the presence of a low molecular weight initiator which contains at least two active hydrogen atoms at a temperature of from about 50° C. to about 300° C. These polyesters are particularly useful as plasticizers and stabilizers for polyvinyl chloride.

3,674,838

VINYL CARBAMYLOXY CARBOXYLATES

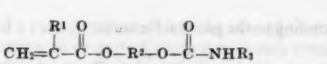
John David Nordstrom, Detroit, Mich., assignor to Ashland Oil, Inc., Ashland, Ky.

Division of Ser. No. 595,333, Nov. 18, 1966, Pat. No. 3,479,328. This application June 5, 1969, Ser. No. 830,880

Int. Cl. C07c *125/06*

U.S. Cl. 260—482 C **8 Claims**

Unsaturated carbamyloxy carboxylates of the formula:



wherein R^1 is hydrogen, halogen, or a monovalent hydrocarbon radical of one to eight carbon atoms, and R^2 is a divalent hydrocarbon radical of one to 12 carbon atoms, and R^3 is a lower alkyl radical of one to eight carbon atoms, or, more preferably, hydrogen. These monomers are useful for preparing a variety of addition polymers.

3,674,839

PRODUCTION OF GLYCEROL ACETATES

Wilhelm Vogt, Efferen near Cologne; Kurt Sennewald, Hermulheim near Cologne, and Hermann Glaser, Lechenich near Cologne, all of Germany, assignors to Knapsack Aktiengesellschaft, Knapsack near Cologne, Germany

Filed Nov. 25, 1970, Ser. No. 92,573

Claims priority, application Germany, Dec. 1, 1969, P 19 60 142.4

Int. Cl. C07c *67/00*

U.S. Cl. 260—491 **6 Claims**

Production of glycerol triacetate and glycerol diacetate by reacting allyl acetate, acetic acid and molecular oxygen at elevated temperatures in liquid phase. The compounds are more particularly produced by reacting a solution of allyl acetate in acetic acid with an oxygen/inert gas-mixture at 80° to 250° C. and under 1 to 200 atm. abs., in the absence of catalysts.

3,674,840

1-(PARA-ALKOXYALKOXY-PHENYL)-2-HYDROXY-3-ALKYLAMINOPROPANES AND THE SALTS THEREOF

Arne Elof Brandstrom, And Mattssonsgatan 13 B, S-415 06 Goteborg; Per Arvid Emil Carlsson, Torild Wulffsgatan 50, S-413 19 Goteborg; Stig Ake Ingemar Carlsson, Honekullavagen 43 F, S-435 00 Molnlycke; Hans Rudolf Corrodi, Kobbehallsvagen 13, S-436 00 Askim; Lars Ek, Syrnegatan 2 A, S-434 00 Kungsbacka; Bo Robert Lamm, Fridkullagatan 23 A, S-412 62 Goteborg, and Bengt Arne Hjalmar Ablad, Folke Bernadottes gata 2, S-411 28 Goteborg, all of Sweden

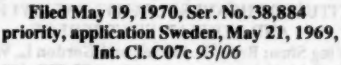
Filed May 19, 1970, Ser. No. 38,884

Claims priority, application Sweden, May 21, 1969, 7153/69

Int. Cl. C07c *93/06*

U.S. Cl. 260—501.17 **8 Claims**

Compounds of the formula:



where Z is an oxaradical (a) R—O—$(CH_2)_n$—O—, (b) R—O—$(CH_2)_m$—O—$(CH_2)_n$—O—; *n* is an integer equal to 2–3; *m* is an integer equal to 2–3 and R is an alkyl radical having one to five carbon atoms; and pharmaceutically acceptable, non-toxic, acid addition salts thereof. Illustrative are compounds where R is isopropyl or t-butyl and Z is CH_3—O—CH_2—CH_2/O—, or CH_3—O—CH_2CH_2—O—CH_2CH_2—O—. Also pharmaceutical compositions containing these compounds, and the use thereof in treating cardiovascular diseases.

3,674,841

10,11-DIHYDRO-,9,10-DIHYDRO-10,10-DIMETHYL-5-OR 9-[3-AMINO-2-OXO -OR-HYDROXY-PROPYLIDENE] - 5H-DIBENZO[A,D] CYCLOHEPTENES AND-ANTHRACENES

Jacques Robert Boissier, Paris, and Roger Ratouis, Saint-Cloud, both of France, assignors to Societe Anonymedite: Roussel-UCLAF, Paris, France

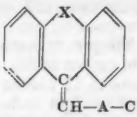
Filed March 3, 1969, Ser. No. 804,024

Int. Cl. C07c *91/02*, *97/10*

U.S. Cl. 260—501.12 **5 Claims**

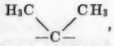
The products are new tricyclic amino compounds and acid addition salts thereof, said tricyclic amino compounds cor-

responding to the general formula:



(1)

where X represents one of the following divalent hydrocarbon radicals:

$-CH_2-CH_2-$, $-CH=CH-$ or  ,

A represents a carbonyl (CO) or a hydroxymethylene (CHOH) group and R represents a monoalkylamino or a dialkylamino radical.

They are very useful substances for human therapeutics, namely as antidepressants and antianxiety agents.

The process for preparing compounds of formula (1) and their salts is disclosed.

3,674,842

HEXAHYDROINDANE DICARBOXYLIC ACID DERIVATIVES

Shohei Hayakawa, Amagasaki; Yoshiko Kanematsu, Kyoto, and Takashi Fujiwara, Amagasaki, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Division of Ser. No. 771,994, Oct. 29, 1968, Pat. No. 3,560,558, which is a continuation-in-part of Ser. No. 478,735, Aug. 10, 1965, abandoned. This application Sept. 25, 1970, Ser. No. 75,728

Int. Cl. C07c *61/32*

U.S. Cl. 260—514 R **3 Claims**

4α-(-Carboxyethyl)-5-oxo-(1α-hydrogen- or 1α-hydroxyl)-7αβ-methyl-3αμ-hexahydroindane-carboxylic acids or lower alkanoic acids, which can be prepared by one-step fermentative degradation of the bile acids or their homologues, are useful as cholesterol lowering agents.

3,674,843

SUBSTITUTED PHENYLSULFAMYL SALICYLIC ACIDS AND DERIVATIVES THEREOF

Tsung-Ying Shen; Bruce E. Witzel, and Gordon L. Walford, all of Westfield, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 836,605, June 25, 1969. This application April 20, 1970, Ser. No. 30,298

Int. Cl. C07c *143/78*

U.S. Cl. 260—519 **13 Claims**

Substituted phenyl sulfamyl or sulfonamido salicylic acids and non-toxic pharmaceutical accepted salts, esters, amides and various derivatives thereof are claimed. Also a method of treating inflammation which comprises administering various substituted phenyl sulfamyl or sulfonamido salicylic acids and the various derivatives are also claimed. The substituted phenyl sulfamyl or sulfonamido salicylic acids described herein have anti-inflammatory, anti-pyretic and analgesic activity.

3,674,844

SALICYLIC ACID DERIVATIVES

Tsung-Ying Shen, Westfield; Howard Jones, Matawan; Bruce E. Witzel, and Gordon L. Walford, both of Westfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 836,623, June 25, 1969. This application April 20, 1970, Ser. No. 30,322

Int. Cl. C07c *103/30*

U.S. Cl. 260—519 **8 Claims**

New substituted salicylic acids and non-toxic pharmaceutically acceptable salts, esters, and amides derived therefrom. The substituted salicylic acids described herein are useful as anti-inflammatory compounds. Also included herein are methods of preparing said salicylic acid compounds, pharmaceutical compositions having said salicylic acid compounds as an active ingredient and methods of treating inflammation by administering these particular compositions to patients.

3,674,845

METHOD OF PRODUCING AROMATIC CARBOXYLIC ACIDS FROM ALKYLBENZENES

Cesare Reni, Busto Arsizio; Giorgio Gualdi, Verona, and Luigi Lugo, Milan, all of Italy, assignors to Societa' Italiana Resine S.p.A., Milan, Italy

Filed June 30, 1970, Ser. No. 51,385

Claims priority, application Italy, July 7, 1969, 19284 A/69

Int. Cl. C07c *63/02*

U.S. Cl. 260—524 R **10 Claims**

A process for the continuous production of aromatic carboxylic acids by the oxidation of alkyl benzenes in an aliphatic carboxylic acid environment and in the presence of catalysts consisting of heavy metal salts in which an activator selected from chlorides and bromides of chloroacetic and bromoacetic acids is present in the reaction mixture.

3,674,846

SYNTHESIS OF SUBSTITUTED 7-OCTEN-1-OLS

Gottfried J. Brendel, Baton Rouge, La., assignor to Ethyl Corporation, New York, N.Y.

Filed Nov. 10, 1969, Ser. No. 875,554. The portion of the term of this patent subsequent to Feb. 3, 1987, has been disclaimed.

Int. Cl. C07c *33/02*; **C11d** *3/50*

U.S. Cl. 260—632 R **16 Claims**

Novel compounds, 7-octen-1-ols having one or two methyl groups in the 6 position are prepared by hydrolyzing an intermediate formed by reaction among aluminum, tetrahydropyran or an alkyl substituted tetrahydropyran, a hydrocarbyl aluminum hydride and butadiene or butadiene substituted on either or both of the internal carbon atoms. During at least a portion of the reaction period the reaction temperature must be in the range of from about 185° to about 210°C. so that there is formed an intermediate condensation product via cleavage of the ring of the tetrahydropyran reactant. The 7-octen-1-ols are useful as perfumes, monomers, chemical intermediates and surface active agents.

3,674,847

PROCESS FOR UREA PRODUCTION IN COMBINATION WITH AMMONIA SYNTHESIS

Petrus J. C. Kaasenbrood, Sittard, and Petrus J. M. van Nassau, Geleen, both of Netherlands, assignors to Stamicarbon N.V., Heerlen, Netherlands

Filed March 17, 1969, Ser. No. 807,749

Claims priority, application Netherlands, March 16, 1968, 6803775

Int. Cl. C07c *127/04*

U.S. Cl. 260—555 A **6 Claims**

A process for the production of urea from ammonia and carbon dioxide, combined with the preparation of ammonia, is disclosed wherein ammonium carbamate in the urea solution produced is removed from said urea solution by subjecting the urea solution to two stripping stages. The first stripping stage uses the urea synthesis starting gas, which contains hydrogen, nitrogen and carbon dioxide. The second stripping stage, which is at substantially the same pressure as the first stripping stage, uses a gas containing at least one of the components needed in the ammonia synthesis. This second stripping gas is substantially free of ammonia and carbon dioxide. The disclosed process has the advantage, compared to prior processes, that the stripping gases need not be compressed at relatively high temperatures.

3,674,848

HYDRATION OF NITRILES USING METAL SALTS OF CATION EXCHANGE RESINS

Erwin Frederick Schoenbrunn, Ridgefeld, and Vinod Tarkeshwar Sinha, Stamford, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Aug. 19, 1970, Ser. No. 65,283
Int. Cl. C07c *103/30*
U.S. Cl. 260—558 R 10 Claims

Solid catalysts for hydration of nitriles to amides comprise metal salts of cation exchange resins. Group I B and II B metals are used with either strong acid or weak acid cation exchange resins. A variety of organic nitriles may be used in the process. Detailed examples describe preparation of several catalysts and the synthesis of acrylamide, acetamide and benzamide. The reactants in liquid solution are contacted with the solid catalyst at 70°–180° C.

3,674,849

2'-5'-DIHALO-3-TERT. ALKYL-5-NITROSALICYLANILIDES

Walter A. Darlington, St. Louis, and John P. Chupp, Kirkwood, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 776,276, Nov. 15, 1968. This application Aug. 3, 1970, Ser. No. 67,651
Int. Cl. C07c *103/26*
U.S. Cl. 260—559 S 5 Claims

Compounds having a 2'-5'-dihalo-3-tert. alkyl-5-nitrosalicylanilido nucleus useful in combatting chewing insect larvae species of the order Lepidoptera, particularly species of the family Noctuidae.

3,674,850

SUBSTITUTED SALICYLANILIDES

David Richard Duke Osborne, Bedford, England, assignor to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 764,040, Sept. 25, 1968, Continuation of Ser. No. 511,989, Dec. 6, 1965. This application Dec. 22, 1969, Ser. No. 887,427
Claims priority, application Great Britain, Dec. 7, 1969, 49,805/64
Int. Cl. C07c *103/38*
U.S. Cl. 260—559 S 21 Claims

The specification discloses salicylanilides and halogenated salicylanilides wherein either or both the aniline or salicyl rings are substituted with a member of the class consisting of phenoxy and halophenoxy groups and the use of these compounds as effective germicides particularly in detergent compositions, such as soap bars.

3,674,851

PROCESS FOR THE PREPARATION OF ALIPHATIC TERTIARY AMIDES

Saburo Senoo; Yohei Fukuoka, and Katuyoshi Sasaki, all of Tokyo, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed March 31, 1970, Ser. No. 24,368
Claims priority, application Japan, April 2, 1969, 44/24831; April 2, 1969, 44/24832; April 2, 1969, 44/24833
Int. Cl. C07c *103/00*
U.S. Cl. 260—561 R 7 Claims

This invention discloses a process for the preparation of aliphatic tertiary amides which comprises reacting a fatty acid represented by the general formula R^1COOH wherein R^1 is a hydrogen atom or an alkyl group having one to six carbon atoms and ammonia directly with an alcohol represented by the general formula R^2OH wherein R^2 is an alkyl group having one to four carbon atoms at a temperature of 100° C. to 800° C. under pressure, said ammonia and alcohol being employed in amounts of 0.8 to five moles and 1.5 to ten moles per mole of fatty acid, respectively. In this process, there may be additionally employed a catalyst to accelerate the rate of reaction. Also, in this invention all or part of starting materials remaining unreacted and/or by-products may be recycled to the starting reaction mixture, thereby enabling the yield of the desired aliphatic tertiary amides to be remarkably improved. In addition, the removal of the water which is produced during the course of reaction assists the present process to be further improved. Thus, according to the present invention, aliphatic tertiary amides can be simply produced with excellent yields from the raw materials which are readily available at low cost, as opposed to the conventional process employing as a starting material dialkylamines which are difficult to obtain in the purified form.

3,674,852

PROCESS FOR PREPARING MESIDINE

Frederick John Averill, and Norman Riley, both of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

Filed May 19, 1969, Ser. No. 826,004
Claims priority, application Great Britain, May 29, 1968, 25,777/68
Int. Cl. C07c *85/00*
U.S. Cl. 260—578 8 Claims

Manufacture of mesidine by isomerization of N,N-dimethyl o-toluidine or -p-toluidine at above 200° C. preferably in presence of a primary or secondary amine as reaction moderator and (when nonferrous lined apparatus is used) in presence of iron or a salt of iron.

3,674,853

SULFUR-CONTAINING CARBORANE DERIVATIVES AND THE METHOD OF PREPARATION

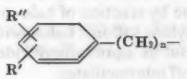
Clayton O. Obenland, Williamsville, N.Y.; Stelvio Papetti, Leominster, Mass., and Hampton D. Smith, Jr., Anaheim, Calif., assignors to Olin Corporation

Continuation-in-part of Ser. No. 554,151, May 31, 1966, abandoned. This application Sept. 25, 1970, Ser. No. 75,701
Int. Cl. C07f *5/02*
U.S. Cl. 260—606.5 B 21 Claims

This invention relates to compounds of the formula:

$$RSCB_{10}H_aX_{10-a}CSR$$

wherein R is selected from the group consisting of hydrogen, alkyl having from one to 18 carbon atoms, and the radical:



wherein R′ and R″ are independently selected from the group consisting of hydrogen and alkyl having from 1 to 5 carbon atoms, and *n* is an integer from 0 to 1 inclusive: X is selected from the group consisting of chlorine, bromine and iodine, and *a* is an integer from 0 to 10 inclusive and to the method of preparing such compounds. It also relates to the metallothiocarboranes having the general formula:

$$MSCB_{10}H_aX_{10-a}CSM$$

wherein M is an alkali metal selected from the group consisting of sodium, lithium and cesium and X and *a* are as previously defined. These compounds find utility as aircraft gas turbine fuels and wood preserves.

3,674,854
(3,5 DIALKYL-4-HYDROXY BENZYL-)TRIALKYL PHOSPHONIUM CHLORIDES AND CORRESPONDING ZWITTERIONS

William H. Starnes, Jr., Baytown, Tex., assignor to Esso Research and Engineering Company

Division of Ser. No. 845,486, July 28, 1968. This application Jan. 25, 1971, Ser. No. 109,556
Int. Cl. C07f 9/54; C07d 105/02
U.S. Cl. 260—606.5 F 4 Claims

This invention relates to (3,5-dialkyl-4- hydroxy benzyl) trialkyl Phosphonium Chlorides and corresponding zwitterions which are useful as intermediates in the preparation of alkenyl phenols. The alkenyl phenols find utility as antioxidants for hydrocarbons and polyolefins.

3,674,855
ORGANIC DIACYL PEROXIDES

Hendrik Van Driel, Hengelo, Netherlands, assignor to N.V. Chefaro Maatschappij, Rotterdam, Netherlands

Filed July 25, 1969, Ser. No. 845,057
Claims priority, application Great Britain, July 30, 1968, 36,204/68
Int. Cl. C07c 147/02
U.S. Cl. 260—607 A 6 Claims

Organic diacyl peroxides containing one or more sulphonyl groups provided which do not explode upon moderate heating, have decreased shock-sensitivity and increase storage stability, and which function as very reactive polymerization initiators or catalysts. The improved diacyl peroxides are produced by reacting the corresponding carboxylic acid halide with hydrogen peroxide in the presence of an acid acceptor at a temperature of from −70° C. to 25° C. and then isolating the peroxide thus formed.

3,674,856
REACTION OF 1, 3-BUTADIENE AND ORGANIC SULFONYL HALIDES

Charles H. Chang, Piscataway, N.J., and David I. Randall, Easton, Pa., assignors to RAF Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 605,623, Dec. 29, 1966, abandoned. This application Oct. 2, 1969, Ser. No. 863,383
Int. Cl. C07c 147/04
U.S. Cl. 260—607 A 2 Claims

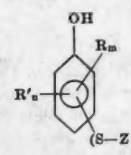
Compounds of the formula Y_n-R-$SO_2CH_2CH{=}CHCH_2X$ wherein X is Cl or Br; Y is Cl, Br, or nitro; R is alkylene or cycloalkylene of one to six carbon atoms; and *n* is an integer of 1 to 5, such as 4-chlorobut-2-enyl-2′-chloroethyl sulfone, prepared for example by reaction of halo- or nitro-substituted alkylene or cycloalkylene sulfonyl halide with butadiene. Such compounds are useful as aquatic herbicides, pesticides, and fiber-reactive dyestuff intermediates.

3,674,857
(((ALKYLTHIO) ALKYL)THIO)PHENOLS

Walter Reifschneider, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed March 2, 1970, Ser. No. 15,845
Int. Cl. C07c 149/36
U.S. Cl. 260—609 F 10 Claims

Novel (((alkylthio)alkyl)thio)phenols corresponding to the formula



wherein R represents a lower alkyl, lower alkoxy, fluoro, chloro, bromo or iodo group; R′ represents an R or a cyclopentyl, cyclohexyl, phenyl, naphthyl, nitro, hydroxy, carboxy, carbalkoxy, trifluoromethyl or cyano group; *m* represents an integer fro 0 to 3; *n* represents an integer fro 0 to 2; Z represents a one to four carbon straight-chain or branched-chain alkylene group; R″ represents a lower alkyl, lower haloalkyl, lower alkenyl, or lower alkynyl group; *p* represents an integer from 1 to 2 and the sum of $m+n+p$ is an integer from 1 to 5. The terms "lower alkyl," "lower haloalkyl" and "lower alkoxy" represent groups containing from one to four carbon atoms. The terms "lower alkenyl" and "lower alkynyl" represent groups containing from two to four carbon atoms. The compounds are useful as pesticides.

3,674,858
PREPARATION OF BENZOYL PEROXIDE

Robert G. La Barge, and Gary L. Johnson, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Oct. 30, 1968, Ser. No. 771,980
Int. Cl. C07c 73/02
U.S. Cl. 260—610 D 7 Claims

Benzoyl peroxide is produced by reacting benzoic anhydride with an alkali metal perborate in an aqueous solution.

3,674,859
AQUEOUS DOXYCYCLINE COMPOSITIONS

Rolf Ernst Beutel; Kathe Christel Lohlbach, and Helmut Wilhelm Raaf, all of Karlsruhe, Germany, assignors to Pfizer Inc., New York, N.Y.

Filed June 25, 1969, Ser. No. 836,591
Claims priority, application Germany, June 28, 1968, P 17 67 891.0
Int. Cl. A61k 21/00
U.S. Cl. 424—80 9 Claims

Aqueous doxycycline solutions suitable for pharmaceutical use contain polyvinylpyrrolidone and are especially useful for either oral, topical or parenteral administration.

3,674,860
ANAPLASMOSIS VACCINES

Clarence J. Welter, Des Moines, Iowa, and Miodrag Ristic, Urbana, Ill., assignors to Diamond Laboratories, Inc., Des Moines, Iowa

Continuation-in-part of Ser. No. 576,545, Sept. 1, 1966, abandoned. This application July 14, 1969, Ser. No. 841,597
Int. Cl. A61k 23/00
U.S. Cl. 424—88 14 Claims

An anaplasmosis vaccine containing an avirulent Anaplasma marginale mutant in a red blood cell carrier is provided. The virulent form is exposed to radiation to accelerate the rate of dissociation of the virulent form to an avirulent form and the irradiated organism is subsequently passed through at least one nonbovine ruminant host.

3,674,861
LIVE ATTENUATED MAREK'S DISEASE VIRUS VACCINE FOR POULTRY

Anthony Edward Churchill, The Elms, Houghton, Huntingdon, England

Continuation-in-part of Ser. No. 843,189, July 18, 1962, abandoned. This application Oct. 31, 1969, Ser. No. 873,060
Claims priority, application Great Britain, Nov. 18, 1968, 54,717/68
Int. Cl. A61k 23/00; C12k 5/00
U.S. Cl. 424—89 17 Claims

Marek's disease virus which causes a serious infection in poultry may be attenuated by serial passage in tissue culture. Passaging causes the loss of the A antigen after a certain

number of passes while important protective antigens are retained. The virus may be attenuated in avian cells particularly those of the chick and duck, kidney cells and embryo fibroblasts being especially preferred. Usually about 20 to 40 passes are required. The live protective virus so obtained is cultivated further into a vaccine for parenteral administration.

3,674,862

LIVE ATTENUATED RABIES VIRUS VACCINE AND PROCESS THEREFOR

John F. Lavender, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed April 2, 1970, Ser. No. 25,243
Int. Cl. C12k *5/00*
U.S. Cl. 424—89 **5 Claims**

Live, attenuated rabies virus vaccine is produced from trypsinized rabies virus infected duck embryo cells grown in cell culture monoclayer. The infectivity for duck embryos of the rabies seed virus is enhanced by growing the CVS–11 fixed rabies virus alternately in mouse brain (or suckling rat brain — SRB) and duck embryo tissue cultures for five alternate passages, and then continuing the growth of the virus in duck embryo tissue cultures for six or seven passages.

3,674,863

POLYVALENT IMMUNIZING AGENTS AND METHODS FOR THEIR PRODUCTION

Myron W. Fisher, Bloomfield Hills, and Stephen Hanessian, Ann Arbor, both of Mich., assignors to Parke, Davis & Company, Detroit, Mich.

Continuation of Ser. No. 729,884, May 17, 1968, abandoned, which is a continuation of Ser. No. 704,995, Feb. 13, 1968, abandoned, which is a continuation-in-part of Ser. No. 619,179, Feb. 28, 1967, abandoned. This application Dec. 8, 1969, Ser. No. 878,985
Int. Cl. A61k *7/16*
U.S. Cl. 424—92 **28 Claims**

Polyvalent antigens, including polyvalent vaccines, containing immunizing antigens from two or more selected strains of *Pseudomonas aeruginosa*. Optionally, the polyvalent antigens are administered to a host to produce an immune globulin. The immune globulin can be used in the form of a whole blood product, a plasma, a serum, or the isolated globulin. The products of the invention are capable of inducing protection against infection with a relatively high percentage of randomly-encountered strains of *Pseudomonas aeruginosa*.

3,674,864

PROCESS FOR STABILIZING PREPARATIONS OF INTERFERING VIRUSES

Romano Angelucci, Milan, Italy, assignor to Carlo Erba S.p.A., Milan, Italy

Continuation-in-part of Ser. No. 687,135, Dec. 1, 1967, abandoned. This application July 8, 1970, Ser. No. 53,325
Claims priority, application Italy, Dec. 16, 1966, 31189 A/66
Int. Cl. C12k *1/08*, *1/00*
U.S. Cl. 424—90 **8 Claims**

A stabilized fluid preparation of interfering viruses containing a minor proportion of a mono- and/or disaccharide and a method of stabilization of interfering virus materials comprising mixing with the virus materials a minor proportion of a mono- and/or disaccharide and freeze-drying the resulting mixture.

3,674,865

PROCEDURE FOR OBTAINING PITUITARY GONADOTROPIC HORMONES FROM URINE

Pietro Donini, Rome, Italy, assignor to Istituto Farmacologico Serono S.p.A., Rome, Italy

Continuation-in-part of Ser. No. 614,749, Feb. 8, 1967, abandoned, which is a continuation-in-part of Ser. No. 285,489, June 4, 1963, abandoned. This application May 11, 1970, Ser. No. 36,484
Claims priority, application Italy, March 11, 1963, 8378 A/63
Int. Cl. A61k *17/08*
U.S. Cl. 424—99 **8 Claims**

A method for the preparation of a urinary gonadotropic hormone preparation containing FSH and LH hormones, the weight ratio of FSH:LH being at least 3:1 by extracting said hormones from menopausal or post-menopausal urine.

3,674,866

MOENOMYCIN AND PROCESS FOR PRODUCING SAME

Fritz Lindner; Karl Heinz Wallhausser, both of Hofheim/Taunus, and Gerhard Huber, Frankfurt/Main, all of Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt/Main, Germany

Continuation-in-part of Ser. No. 216,751, Aug. 14, 1962, abandoned, which is a continuation-in-part of Ser. No. 87,750, Feb. 8, 1961, abandoned. This application Sept. 1, 1964, Ser. No. 393,760
Claims priority, application Germany, Feb. 10, 1960, F 30,506
Int. Cl. A61k *21/00*
U.S. Cl. 424—118 **8 Claims**

A high molecular weight amorphous polysaccharide antibiotic composition containing about 1.9 percent by weight phosphorus, 48.5 percent carbon, 7.3 percent hydrogen, 5.1 percent nitrogen and the balance oxygen; having a molecular weight of 68,000 to 70,000, infra-red absorption spectrum maxima, for the sodium salt at 2.95, 3.40, 6.00, 6.53, 7.28, 8.20 and 9.38 μ and activity in vitro and in vivo against gram positive microorganisms; and process of preparing same by cultivation of *S. bambergiensis*, *S. ghanaensis*, *S. ederensis* or *S. geysiriensis*.

3,674,867

TUMIMYCIN AND PROCESS FOR MAKING SAME

Adorjan Aszalos, Princeton; Robert S. Robison, North Brunswick; Nancy Kraemer, Cranford, all of N.J.; Jo Ann Henshaw, Staten Island, N.Y., and Mary Suzanne Giannini, New Brunswick, N.J., assignors to E. R. Squibb & Sons, Inc., New York, N.Y.

Filed Aug. 6, 1970, Ser. No. 61,564
Int. Cl. A61k *21/00*
U.S. Cl. 424—122 **2 Claims**

An antibiotic selected from the group consisting of Tumimycin and salts thereof. This antibiotic is an orange-red powder having the following average elemental analysis: carbon, 66.79 percent; hydrogen, 6.85 percent; nitrogen, 3.45 percent; and an infrared absorption spectrum as shown in FIG. 1 and an NMR spectrum as shown in FIG. 2. Tumimycin is useful as an antimicrobial agent.

3,674,868

CRYSTALLINE FUNGIMYCIN, A METHOD OF PREPARING SAME, COMPOSITIONS AND USE

Jorgen Martin Dohm Schou, Copenhagen, Denmark, assignor to Kefalas A/S, Copenhagen-Valby, Denmark

Continuation-in-part of Ser. No. 782,995, Dec. 11, 1968, abandoned. This application May 28, 1969, Ser. No. 828,742
Int. Cl. A61k *21/00*
U.S. Cl. 424—122 **8 Claims**

Crystalline fungimycin, a process of purifying non-crystalline, amorphous fungimycin in order to obtain said crystalline

material, compositions in oral dosage forms containing crystalline fungimycin and a method for the treatment of prostate hypertrophy in mammals with an effective dose of crystalline fungimycin.

3,674,869
COMPOSITIONS FOR STABILIZING TRANS-DIETHYLSTILBESTROL

Nelson H. Ludwig, Greenfield, and William A. White, Fountaintown, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed June 12, 1970, Ser. No. 45,911
Int. Cl. A61k *17/06, 27/00*
U.S. Cl. 424—175 **4 Claims**

Trans-diethylstilbestrol is stabilized in liquid and solid animal feed formulations by adding thereto an inhibitory amount of a compound containing sulfur, in the form of a thiol group or a thiol precursor group, to substantially inhibit isomerization to the cis-diethylstilbestrol. Elemental sulfur likewise inhibits the isomerization in the presence of base.

3,674,870
PHENYL BENZOIC ACID COMPOUNDS IN COMPOSITIONS AND METHODS FOR TREATING INFLAMMATION

William V. Ruyle, Scotch Plains; Lewis H. Sarett, Skillman, and Alexander R. Matzuk, Colonia, all of N.J., assignors to Merck & Co. Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 699,022, Jan. 19, 1968, abandoned, which is a continuation-in-part of Ser. No. 577,819, Sept. 8, 1966, abandoned, which is a continuation-in-part of Ser. No. 420,823, Dec. 23, 1964, abandoned. This application June 9, 1970, Ser. No. 44,868
Int. Cl. A61v *27/00*
U.S. Cl. 424—230 **22 Claims**

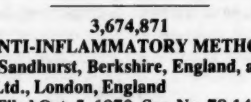
The invention relates to a method of treating inflammation by administering substituted 5-(phenyl) benzoic acids, esters and non-toxic pharmaceutically accepted salts thereof to patients.

3,674,871
ANTI-INFLAMMATORY METHOD

Delme Evans, Sandhurst, Berkshire, England, assignor to Lilly Industries, Ltd., London, England

Filed Oct. 5, 1970, Ser. No. 78,146
Claims priority, application Great Britain, Oct. 7, 1969, 49,196/69
Int. Cl. A61k *27/00*
U.S. Cl. 424—270 **4 Claims**

A method for treating inflammation in warm-blooded mammals comprising administering at a daily dose between 10 and 450 mg./kg. of body weight a 2-acylamino-4-(alkoxyalky or alkylthioalkyl)thiazone of the formula



wherein R_1 and R_2 are H or C_1–C_6 alkyl, R_3 is C_1–C_6 alkyl, Y is —0—, —S—, —SO— or —SO_2— and *n* is 1-4 and the pharmaceutically acceptable salts thereof.

3,674,872
ANTIMALARIAL COMPOSITIONS

Alfred Rheiner, Jr., Basel, Switzerland; Michel Fernex, Durmenach, France, and Jose Herrero, Basel, Switzerland, assignors to Hoffman-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 791,518, Jan. 15, 1969, abandoned. This application Sept. 29, 1970, Ser. No. 76,593
Int. Cl. A61k *27/00*
U.S. Cl. 424—229 **8 Claims**

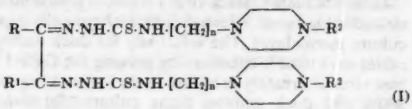
Antimalarial compositions comprising sulfadimethoxine [N′-(2,6-dimethoxy-4-pyrimidinyl)-sulfanilamide] and proguanil [1-(p-chlorophenyl)-5-isopropyl-biguanide] or their salts are described.

3,674,873
METHOD OF TREATING OR PREVENTING COCCIDIOSIS

Paul Anthony Barrett, London, England, assignor to Burroughs Wellcome Co.

Division of Ser. No. 550,934, May 18, 1966, Pat. No. 3,577,421. This application July 7, 1970, Ser. No. 53,040
Claims priority, application Great Britain, May 25, 1965, 22,006/65
Int. Cl. A61k *27/00*
U.S. Cl. 424—250 **18 Claims**

A method of treating or preventing coccidiosis in poultry which comprises orally administering to poultry an effective coccidiosis treatment or preventing amount of a compound of the Formula (I) or a pharmacologically acceptable acid addition salt thereof



(I)

wherein R and R′ are the same or different and each is a hydrogen atom, loweralkyl, cyclohexyl, benzyl, phenyl, halogen substituted phenyl, or loweralkoxyloweralkyl, R^2 is lower alkyl and *n* has an integral value from 1 to 8. A composition comprising the compound of formula I and a pharmacologically acceptable carrier.

3,674,874
INSECTICIDAL AND ACARICIDAL COMPOSITIONS

Hans Rutz, Basel, and Kurt Gubler, Riehen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 723,905, April 24, 1968, abandoned. This application June 8, 1970, Ser. No. 44,558
Claims priority, application Switzerland, April 26, 1967, 5960/67
Int. Cl. A01n *9/22*
U.S. Cl. 424—273 **13 Claims**

A method of controlling insects and a method for controlling acarinae, especially of the kind infesting warm-blooded animals as well as compositions are described which involve the use of an insecticidally or acaricidally effective amount of a 2,4,5-trihalogenoimidazole substituted in 1-position by a group of the formula R — X — A — wherein R represents an optionally substituted aliphatic hydrocarbon radical; X represents one of the bridges —O—, —S—,

and

, and A represents an alkylene radical, the compositions also contain carriers, distributing agents and the like which are compatible with the aforesaid active compounds and well tolerated by warm-blooded animals.

3,674,875
THE TREATMENT OF INFLAMMATION

Tsung-Ying Shen, Westfield; William V. Ruyle, Scotch Plains; Bruce E. Witzel, and Gordon L. Walford, both of Westfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 836,603, June 25, 1969. This application April 20, 1970, Ser. No. 30,364
Int. Cl. A61k *27/00*
U.S. Cl. 424—285 **3 Claims**

This invention relates to new tricyclic carboxylic acid and ester derivatives and processes for their preparation. These

compounds have anti-inflammatory, anti-pyretic and analgesic activity. Also included are claims for methods of treating inflammation using the carboxylic acid compounds of this invention.

3,674,876

BENZOTHIAZINE DIOXIDES AS LIPID REGULATING AGENTS

Joseph G. Lombardino, Niantic, and Gerald F. Holland, Old Lyme, both of Conn., assignors to Pfizer Inc.

Filed June 9, 1969, Ser. No. 831,768
Int. Cl. A61k *27/00*
U.S. Cl. 424—246 **36 Claims**

Certain 3,4-dihydro-4-oxo-2H-1,2-benzothiazine-3-carboxamide-1,1-dioxide and 3-oxo-2H-1,2-benzothiazine-4-carboxamide-1,1-dioxide compounds effective as lipid regulating agents are disclosed.

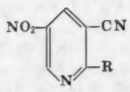
3,674,877

PESTICIDALLY ACTIVE COMPOUNDS AND COMPOSITIONS CONTAINING THEM

Peter Frank Hilary Freeman, Reading, England, assignor to Imperial Chemical Industries Limited, London, England

Filed June 2, 1970, Ser. No. 42,858
Int. Cl. A01n *9/22*
U.S. Cl. 424—263 **4 Claims**

Fungicidal and insecticidal compositions comprise as an active ingredient a compound of formula:



wherein R represents an atom of halogen, a hydroxy group or an ether derived therefrom, a mercapto group or a thioether derived therefrom, a sulphenylthio group, an unsubstituted or substituted amino group, or an N- containing heterocyclic group linked through the N- atom to the pyridine ring; or either (i) a quaternary salt thereof or (ii) an N-alkylated tautomer thereof.

3,674,878

PROCESS FOR CONTROLLING NEMATODES

Edward R. Degginger, Convent Station, N.J., and Frederick J. Goetz, Tacoma Park, Md., assignors to Allied Chemical Corporation, New York, N.Y.

Filed May 4, 1970, Ser. No. 34,559
Int. Cl. A61n *9/20*
U.S. Cl. 424—330 **1 Claim**

Process for controlling nematodes by treating nematode infested soil with a toxic quantity of 4-aminobiphenyl or a derivative thereof which is capable of being hydrolyzed to 4-aminobiphenyl.

3,674,879

PROCESS FOR PREPARING CHLORO-SUBSTITUTED BIS(HYDROXYPHENYL)METHANES

Harlan E. Tiefenthal, Western Springs; Eric Jungermann, Chicago; Eugene J. Miller, Jr., Wheaton, and John J. Callahan, Park Ridge, all of Ill., assignors to Armour Industrial Chemical Company, Chicago, Ill.

Continuation-in-part of Ser. No. 492,293, Oct. 1, 1965, abandoned. This application April 24, 1968, Ser. No. 723,893
Int. Cl. C07c *37/00, 39/16*
U.S. Cl. 260—619 A **16 Claims**

A process for preparing chloro-substituted bis (hydroxyphenyl)methanes by reacting a formaldehyde yielding substance with chloro-substituted phenol is the presence of hydrogen fluoride. Such chloro-substituted bis(hydroxyphenyl) methanes are useful as bactericides.

3,674,880

METHODS FOR PREPARING VALUABLE KETO AND HYDROXY CYCLIC COMPOUNDS

Charles H. Fisher, 1624 Mirabeau Avenue, New Orleans, La.

Filed Jan. 3, 1968, Ser. No. 695,323
Int. Cl. C07c *37/00*
U.S. Cl. 260—621 R **5 Claims**

This invention relates to the conversion of poly-exomethylene cyclohexanes and poly-exomethylene cylcohexenes to ketone cyclic compounds and hydroxy aromatic compounds. The exo-methylene groups ($= CH_2$) are first converted to ozonides and the ozonide is then converted to ketones which rearrange to the hydroxy cyclic and aromatic compounds.

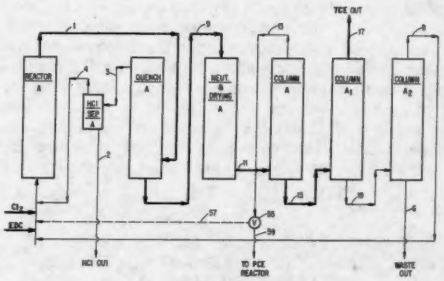
The resultant hydroxy compounds are used as antioxidants, preservatives, intermediates for making resins, plastics, adhesives, pharmaceuticals, and dyes.

3,674,881

INTEGRATED PROCESS FOR THE PRODUCTION OF CHLORINATED HYDROCARBONS

James J. Lukes, Cleveland, and Robert J. Koll, Mayfield Village, both of Ohio, assignors to Diamond Shamrock Corporation, Cleveland, Ohio

Filed Dec. 15, 1969, Ser. No. 885,183
Int. Cl. C07c *21/00*
U.S. Cl. 260—65.4 H **4 Claims**



The process involves the preparation of trichloroethylene and perchlorethylene in separate production trains the operation of which, however, is integrated with respect to the recycle of certain organic streams for the purpose of improving product purity and simplifying separation procedures.

3,674,882

DICHLORO TRIFLUOROMETHYL PHENYL LITHIUM

William J. Houlihan, Mountain Lakes, N.J., assignor to Sandoz-Wander, Inc., Hanover, N.J.

Continuation-in-part of Ser. No. 816,084, April 14, 1969, Pat. No. 3,592,842, which is a continuation-in-part of Ser. No. 729,944, May 17, 1968, abandoned. This application Jan. 21, 1971, Ser. No. 108,640
Int. Cl. C07f *1/02*; B21d *3/02*
U.S. Cl. 260—665 R **4 Claims**

Dichloro trifluoromethyl phenyl lithium compounds are prepared by reacting a dichloro trifluorotoluene with an alkyl lithium compound and are useful as intermediates in the preparation of dichloro-trifluoromethyl benzoic acids which are CNS depressants and agrochemical agents.

3,674,883

RECOVERING CYCLOPENTADIENE VALUES FROM C_5 FRACTIONS

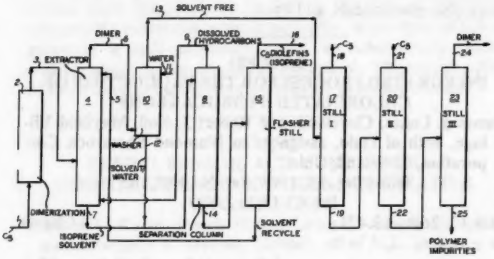
Bernhard Schleppinghoff, Dormagen; Helmut Scherb, Sinnersdorf, and Hans Puxbaumer, Cologne-Zollstock, all of Germany, assignors to Erdolchemie Gesellschaft mit beschrankter Haftung, Cologne, Germany

Filed Aug. 11, 1970, Ser. No. 62,937

Claims priority, application Germany, Aug. 16, 1969, D 19 41 704.0

Int. Cl. C07c *7/00*

U.S. Cl. 260—666 A **7 Claims**



A process for recovering the cyclopentadiene values from a cyclopentadiene-containing C_5 fraction consisting of a mixture of paraffinic, olefinic and diolefinic hydrocarbons, which comprises subjecting the fraction to treatment to dimerize the cyclopentadiene to dicyclopentadiene; subjecting the fraction to a liquid-liquid extraction with a selective solvent whereby there is formed a solvent phase containing the diolefinic hydrocarbons and a paraffin-olefin phase containing the dicyclopentadiene, and recovering the dicyclopentadiene from said paraffin-olefin phase by distillation.

3,674,884

PROCESS FOR THE PREPARATION OF AROMATIC HYDROCARBONS CONTAINING MONOETHYLENIC UNSATURATED RADICALS

Ichiro Moritani, Takaishi-shi, and Yuzo Fujiwara, Oyonaka-shi, both of Japan, assignors to Ube Industriee, Ltd., Nishihonmachi, Ube-shi Yamaguchi-ken, Japan

Filed July 29, 1968, Ser. No. 748,222

Claims priority, application Japan, Aug. 4, 1967, 42/49709

Int. Cl. C07c *15/10*

U.S. Cl. 260—669 R **10 Claims**

Process for the preparation of aromatic hydrocarbon compounds containing monoethylenically unsaturated radicals, which comprises reacting a monoethylenically unsaturated compound with an aromatic hydrocarbon compound in the presence of a palladium salt.

3,674,885

ALKYLATION OF BENZENE UTILIZING FISCHER-TROPSCH OLEFIN-PARAFFIN MIXTURES

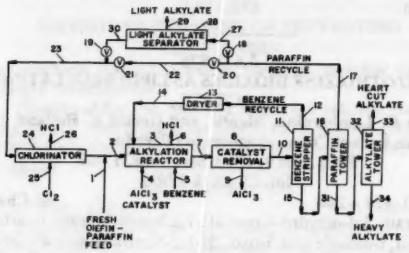
William K. Griesinger, Haverford, Pa.; Harold A. Sorgenti, Olympia Fields, Ill., and George W. Schell, Broomall, Pa., assignors to Atlantic Richfield Company, New York, N.Y.

Filed Oct. 9, 1970, Ser. No. 79,389

Int. Cl. C07c *3/56*

U.S. Cl. 260—671 B **7 Claims**

Paraffin-olefin mixtures synthesized by the Fischer-Tropsch process are used to alkylate benzene at high temperatures in the presence of an aluminum chloride catalyst at low catalyst volume to feed volume ratios. The paraffins are separated from the alkylation effluent and are recycled to a chlorination step from which the paraffin-chloroparaffin effluent mixture is combined with the fresh feed Fischer-Tropsch olefin-paraffin



mixture and the combined feeds are used to alkylate the benzene.

3,674,886

METHOD OF PREVENTING DOUBLE BOND MIGRATION OF MONO-OLEFINIC HYDROCARBONS IN SELECTIVE HYDROGENATION

Youji Komatsu, Chiba; Yasuhiro Furukawa, Saitama, and Takashi Yokomizo, Chiba, all of Japan, assignors to Maruzen Oil Company Limited, Osaka, Japan

Filed Jan. 22, 1971, Ser. No. 109,051

Claims priority, application Japan, Jan. 26, 1970, 45/6333

Int. Cl. C07c *11/00, 11/12*

U.S. Cl. 260—677 H **18 Claims**

A method of preventing double bond migration of a mono-olefin hydrocarbon during the selective hydrogenation of a polyunsaturated hydrocarbon coexisting with a mono-olefinic hydrocarbon, each of the mono-olefinic hydrocarbons and polyunsaturated hydrocarbons having at least four carbon atoms, in the presence of hydrogen, using a palladium- or nickel-hydrogenation catalyst, which comprises adding carbon monoxide to the reaction system in an amount of from 1 to 50 mol. % based on said hydrogen during the initial stage of the selective hydrogenation reaction and following the initial stage, lowering the content of carbon monoxide to a range of from 0.05–1 mol. % based on the hydrogen.

3,674,887

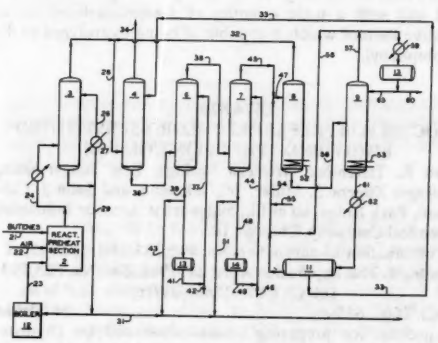
OXIDATIVE DEHYDROGENATION PROCESS

Harris A. Clay, Bartlesville, Okla., assignor to Phillips Petroleum Company

Filed Dec. 24, 1970, Ser. No. 101,277

Int. Cl. C07c *5/18*

U.S. Cl. 260—680 E **9 Claims**



Impurities introduced during the oxidative dehydrogenation of paraffin or olefin hydrocarbons are removed from the olefin

product using water and caustic scrubbing. The olefin product while absorbed in an oil is scrubled with the caustic solution.

3,674,888

PROCESS FOR SELECTIVELY HYDROGENATING UNSATURATED HYDROCARBONS

Michel Derrien, and Jean Francois Le Page, both of Rueil Malmaison, France, assignors to Institut Francias du Petrole des Carburants et Lubrifiants

Filed Dec. 8, 1970, Ser. No. 96,277
Claims priority, application France, Dec. 12, 1969, 6943283
Int. Cl. C01c *5/08*
U.S. Cl. 260—681.5 7 Claims

This invention relates to a process for selectively hydrogenating unsaturated hydrocarbons in the liquid phase, in the presence of a catalyst comprising palladium on an alumina carrier, said catalyst resulting from contacting alumina agglomerates of at least a 120 m^2/g specific surface with steam at 110° – 300° C. for at least 15 minutes, drying the resulting agglomerates, heating them to a temperature from 500° to 1,200° C., so as to obtain alumina agglomerates of a 40 – 100 m^2/g specific surface, admixing said agglomerates with a palladium compound and heating up the resulting mixture to 300° – 600° C.

3,674,889

PREPARATION OF OLEFINS VIA PT-SN CATALYST

Raymond A. Schell, Berkley, and Lawrence J. Kehoe, Huntington Woods, both of Mich., assignors to Ethyl Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 776,788, Nov. 18, 1968, abandoned. This application June 23, 1970, Ser. No. 49,161
Int. Cl. C07c *1/20, 11/12*
U.S. Cl. 260—681 16 Claims

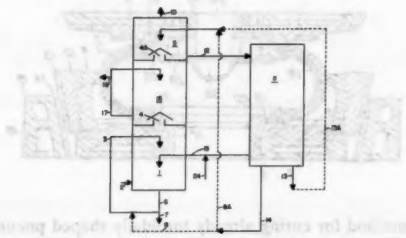
A process for preparing unsaturated organic compounds by reacting an allylic alcohol and a ketone or aldehyde in the presence of carbon monoxide using a hydrohalo acid of a Group VIII metal/germanium or tin salt combination catalyst is described. The unsaturated organic compounds are principally hydrocarbon olefins having a molecular weight greater than the allylic alcohol reactant.

3,674,890

QUENCHING PROCESS FOR PYROLYTICALLY CRACKED HYDROCARBONS

Thaddeus J. Oleszko, Neu Otting, and Lynn P. Walker, Burghausen, both of Germany, assignors to Marathon Oil Company, Findley, Ohio

Filed March 4, 1970, Ser. No. 16,443
Int. Cl. C07c *3/00*; C10g *9/12*
U.S. Cl. 260—683 22 Claims



Improved quenching of pyrolytically cracked gas is effected by separating the hydrocarbon-water emulsion produced in a quenching zone having a plurality of stages and then transferring the emulsion to the initial stage of the quenching zone wherein incoming gases vaporize the water from the emulsion. Also, transferring a slurry containing particulate carbon, e.g., produced in the Wulff process by scrubbing the exhaust gases of the generation step, to the initial stage of the quenching zone and recovery of hydrocarbon and particulate carbon is taught.

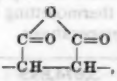
3,674,891

NON-CROSSLINKED OLEFINIC SILOXANE-ORGANIC POLYMER GRAFT COPOLYMERS

Marshall L. Wheeler, Jr., Olean, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 422,037, Dec. 29, 1964, Pat. No. 3,573,334, which is a continuation-in-part of Ser. No. 356,944, April 2, 1964, abandoned. This application July 23, 1970, Ser. No. 57,797
Int. Cl. C08g *47/10*; C08f *29/50*
U.S. Cl. 260—827 4 Claims

This invention provides non-crosslinked copolymers of olefinic siloxanes grafted to one of a particular class of organic polymers [i.e. polyurethanes, polyesters, epoxy resins, polyacetals, polysulfides, polycarbonates, phenoxy resins, mineral oils, polystyrene, polyacrylates, polyvinyl chloride and polymers comprising at least one of the following types of units:
$-CH_2-CH(OCOCH_3)-$,



$-CH_2-CCl-$, $-CH_2-CFH-$, $-CF_2-$, $-CH_2-CH(CN)-$, $-CH_2-CH(OR)-$, $-CH_2-CH-CCl_2-$, $-CH_2-CH\ C(CH_3)-CH_2-$ and $-CH_2CH\ ClCH_2-$ wherein R is alkyl].

3,674,892

INTERNALLY PLASTICIZED EPOXIDE RESINS OF TRIGLYCIDYL ISOCYANURATE, HYDROXY FUNCTIONAL URETHANE POLYMER AND POLYCARBOXYLIC ACID ANHYDRIDE

Zissis Aggias, Hilden, Germany, assignor to Henkel & Cie, GmbH, Dusseldorf, Germany

Filed Oct. 13, 1969, Ser. No. 866,017
Claims priority, application Germany, Oct. 31, 1968, P 18 06 202.7
Int. Cl. C08g *45/14, 45/12*
U.S. Cl. 260—835 7 Claims

A process for the preparation of internally plasticized hardened epoxide resin having increased flexibility without a substantial effect on its thermal properties which comprises the steps of reacting a mixture consisting essentially of (1) a crystalline triglycidyl isocyanurate having an epoxide oxygen content of at least 14 percent, (2) an organic polycarboxylic acid anhydride epoxide hardener, and (3) from 10 to 30 percent by weight, based on the amount of (1) and (2) above, of long-chain organic polyurethanes having at least two free hydroxyl groups per molecule and free of other reactive groups, said polyurethanes having a molecular weight between 800 and 5,000, under epoxide resin hardening conditions, and recovering said internally plasticized hardened epoxide resin.

3,674,893

THERMOSETTABLE RESINS CONTAINING VINYLESTER RESIN, POLYDIENE RUBBERS AND VINYL MONOMERS

Robert M. Nowak, and Thomas O. Ginter, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 812,326, April 1, 1969, abandoned. This application March 9, 1970, Ser. No. 17,947
Int. Cl. C08g *45/04*
U.S. Cl. 260—836 19 Claims

Stable compositions are prepared from a mixture of an unsaturated vinyl ester thermosettable resin containing a

copolymerizable monomer and an unsaturated polydiene rubber having an inherent viscosity between about 0.30 to 1.2 deciliters/gram. Thermoset articles reinforced with glass fibers, etc. prepared from said composition have improved properties such as impact strength, surface smoothness and paintability as well as good mechanical properties such as tensile strength and modulus. The compositions are noteworthy in their ability to accept pigments uniformly without producing mottling even with dark pigments.

3,674,894

UNSATURATED POLYESTER RESINS MODIFIED WITH ORGANIC DIBASIC ACID SALTS

James Economy, Buffalo; Luis C. Wohrer, Lewiston, and John H. Mason, Clarence, all of N.Y., assignors to The Carborundum Company, Niagara Falls, N.Y.

Division of Ser. No. 751,647, June 24, 1968, Pat. No. 3,567,689, which is a division of Ser. No. 353,266, March 19, 1964, Pat. No. 3,418,273. This application May 5, 1970, Ser. No. 46,568

Int. Cl. C08f *43/00, 43/02*

U.S. Cl. 260—875 **7 Claims**

Metal salts of alkanedioic and aromatic dibasic acids are used to improve one or more of the physical properties of certain thermoplastic and thermosetting resins, either before or after exposure to high temperatures.

3,674,895

POLYMERIZATION OF 1-OLEFINS WITH MULTIFUNCTIONAL INITIATOR SYSTEMS

Rudolf H. Gaeth, Lake Jackson, Tex., and Ralph C. Farrar, Bartlesville, Okla., assignors to Phillips Petroleum Company

Filed May 12, 1969, Ser. No. 823,941

Int. Cl. C08f *1/28, 3/06, 3/18*

U.S. Cl. 260—878 B **6 Claims**

1-Olefins are efficiently polymerized with an initiator system formed from an organomonolithium compound, a polyvinyl aromatic compound, an N,N,N',N'-hydrocarbyl-substituted ethylenediamine compound and optionally, a solubilizing monomer.

3,674,896

BONDING WITH AMMONIUM POLYMER SALTS

Chester L. Purcell, and Walter H. Smarook, both of Somerville, N.J., assignors to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 669,259, Sept. 20, 1967, abandoned, Continuation-in-part of Ser. No. 568,409, July 28, 1966, abandoned. This application June 3, 1970, Ser. No. 43,196

Int. Cl. C08f *29/12*

U.S. Cl. 260—897 B **10 Claims**

Water-soluble ammonium salts of ethylene-acrylic acid copolymers are used to coat or bond various substrates with water insoluble ethylene-acrylic acid copolymers by first applying the salt alone or with polyvinyl alcohol to the substrate from aqueous solutions or dispersions and then drying the treated substrate. During the drying step ammonia is evolved leaving the ethylene-acrylic acid copolymer on the substrate. This invention has been used to coat articles with a temporary coating, and to prepare floor polishes, paper coatings, nonwoven fabrics and water-proof wood.

3,674,897

PROCESS FOR MANUFACTURING TRIALKYL PHOSPHITES

Fusao Tada, Nara-shi; Seiei Inamine, Osaka-shi, and Tsutomu Hatanaka, Sakai-shi, all of Japan, assignors to Sakai Chemical Industry Company Limited, Osaka-fu, Japan

Filed Nov. 25, 1969, Ser. No. 879,933

Int. Cl. C07f *9/08*; C10m *1/46*

U.S. Cl. 260—976 **8 Claims**

A process for manufacturing trialkyl phosphite comprises adding with stirring a phosphorus trihalide at a temperature of −5° to 30° C to at least stoichiometric amount of an aliphatic alcohol having one to 18 carbon atoms in the presence of at least one of an organic acid and ammonium salt thereof while introducing ammonia to the reaction system to maintain the pH value in the system in the range of 6.5 to 10.0 to thereby effect the reaction of the phosphorus trihalide and the aliphatic alcohol to produce trialkyl phosphite. Said organic acid has a dissociation constant in water at 25° C of 1×10^{-7} to 9×10^{-6}.

3,674,898

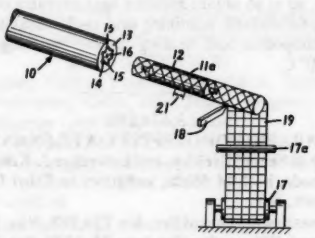
METHOD FOR BIAS CUTTING A TUBULAR NET

Ronald L. Larsen, Minneapolis, Minn., assignor to Conwed Corporation

Continuation of Ser. No. 793,079, Jan. 22, 1969, abandoned. This application Feb. 24, 1971, Ser. No. 117,922

Int. Cl. B29d *23/04, 7/16*

U.S. Cl. 264—146 **9 Claims**



This invention provides a method for continuously severing a rotating and axially moving tubular net, having an axially oriented pattern, along a bias line thereof to transform the tubular net into a continuous flat web having a length oriented pattern different from the axially oriented pattern of the tubular net.

3,674,899

PROCESS FOR CURING PNEUMATIC TIRES

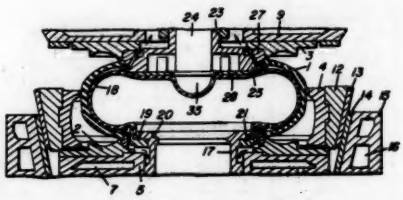
Renato Caretta, Gallarate, and Antonio Pacciarini, Milan, both of Italy, assignors to Industrie Pirelli S.p.A., Milan, Italy

Division of Ser. No. 607,227, Jan. 4, 1967, Pat. No. 3,520,024. This application Jan. 13, 1970, Ser. No. 2,510

Claims priority, application Italy, Jan. 13, 1966, 13350/66

Int. Cl. B29h *5/02*

U.S. Cl. 264—315 **4 Claims**



A method for curing already toroidally shaped pneumatic tires. The tire beads are forced into their respective seats in axially approachable mold section while the mold sections are spaced from each other and the mold open. A flexible curing bag is introduced inside the tire, expanded, and pumped to remove air trapped between its outer surface and the inside of the tire while the beads remain in their respective seats. The mold is then closed and the tire cured. Rigid mechanical means can be used to force the beads into the seats.

3,674,900
RADIOACTIVE MACROAGGREGATES OF SERUM ALBUMIN

Lloyd M. Thompson, 144 Millhaven Avenue, Pointe Claire, Quebec, Canada

Filed Jan. 3, 1967, Ser. No. 606,525
Int. Cl. A61k *27/04*
U.S. Cl. 424—1 **5 Claims**

Human serum albumin is made radioactive, denatured, and then agglutinated to form macroaggregates of a nearly uniform size. This latter is achieved by the use of weak organic acids. Their uniform size makes them more suitable for scintiscanning.

3,674,901
SURGICAL SUTURES

Thomas H. Shepherd, Hopewell, and Francis E. Gould, Princeton, both of N.J., assignors to National Patent Development Corporation, New York, N.Y.

Continuation-in-part of Ser. Nos. 567,856, July 26, 1966, Pat. No. 3,220,949, and Ser. No. 650,259, June 30, 1967, Pat. No. 3,572,685, which is a division of Ser. No. 654,044, July 5, 1967, abandoned. This application April 27, 1970, Ser. No. 32,448. The portion of the term of this patent subsequent to Feb. 25, 1986, has been disclaimed.
Int. Cl. A61l *15/00, 17/00*
U.S. Cl. 424—27 **2 Claims**

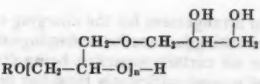
A process for preparing hydrophilic cross-linked polymers and products prepared thereby, said process comprising admixing in a solvent-free system in the presence of a free radical, vinyl polymerization catalyst and reacting a major amount of a water-soluble polymerizable monoester of an olefinic acid having at least one substituted functional group with a minor amount of a polymerizable diester of one of said olefinic acids having at least two esterifiable hydroxyl groups. The novel products include a solid friable foam which can be disintegrated to powder. Shaped bodies can be prepared in the from of articles which can be cast with additives such as fragrances, medicinals, flavors, chemicals and the like, which are gradually released from the article when it is wetted in water or alcohol. Liquid casting syrups adapted to be polymerized in situ with or without additives can be formed. The casting syrups can be prepared in water to yield a polymer soluble in alcohol which is suitable for formation of hydrophilic coatings as by spray, dip, casting and the like. Surgical suture threads can be coated with the polymers.

3,674,902
HAIR COSMETIC COMPOSITIONS CONTAINING NON-IONIC SURFACE ACTIVE AGENTS

Gregoire Kalopissis, Paris, and Guy Vanlerberghe, Mitry-Mory (Seine et Marne), both of France, assignors to Societe anonyme dite: L'Oreal, Paris, France

Continuation-in-part of Ser. No. 541,527, April 11, 1966, abandoned. This application Sept. 27, 1968, Ser. No. 763,340
Claims priority, application Luxembourg, April 15, 1965, 48,400; March 28, 1966, 50,777
Int. Cl. A61k *7/06, 7/12*
U.S. Cl. 424—70 **7 Claims**

Cosmetic compositions, such as shampoos and hair dyes, which contain non-ionic surface active agents that form cleaning compositions that do not irritate the mucous membrane of the eyes having the formula



in which R is selected from the group consisting of alkyl, alkenyl and alkyl and alkenyls having intervening CONH, O and CHOH groups having eight to 22 carbon atoms, and n is 1 to 5 and methods of making said compound.

ERRATA

For Classes 424—80 to 424—330 see:
Patent Nos. 3,674,859 thru 3,674,878

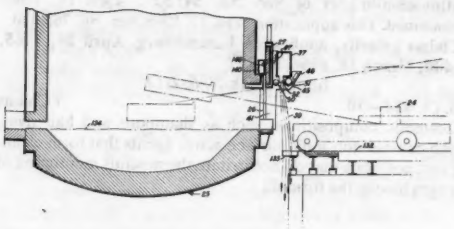
ELECTRICAL

3,674,903

METHOD AND APPARATUS FOR REDUCING AIR INFILTRATION INTO ELECTRIC ARC FURNACE DURING THE CHARGING AND MELTING OPERATION

William W. Bintzer, Malvern, Pa., assignor to Lukens Steel Company, Coatesville, Pa.

Filed April 20, 1971, Ser. No. 135,678
Int. Cl. F27d *23/00*
U.S. Cl. 13—9 **19 Claims**



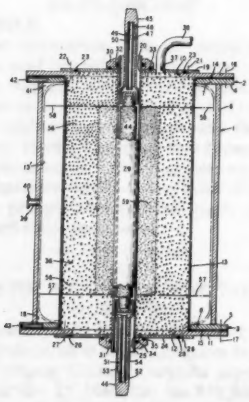
An air curtain arrangement for the charging opening of an electric arc steelmaking furnace for restricting entry of air into the furnace, the air curtain apparatus being disposed above the opening and spaced sufficiently from the furnace wall to permit the door which normally covers the opening to be raised. An air screen is directed downwardly and a pair of side air flows are provided to screen the areas between the furnace wall and the air screen which is provided across the opening. Two further air flows are directed against the sides of the door, one on each side thereof for the purpose of screening these areas against incursion around the raised door of outside air into the furnace which is maintained at a pressure slightly less than atmospheric pressure during the door charging operation.

3,674,904

FURNACE FOR MAKING FUSED QUARTZ HOLLOW SLUGS

Lothar Jung, Millington, N.J., assignor to Amersil, Inc., Hillside, N.J.

Filed May 21, 1971, Ser. No. 145,611
Int. Cl. F27b *15/00*; F27d *3/00*; H05b *3/40*
U.S. Cl. 13—20 **6 Claims**



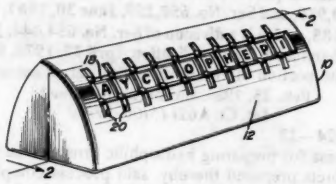
A furnace for making fused quartz hollow slugs comprising a tubular housing containing an elongated electrical resistor heating means mounted coaxially in the housing with a quartz powder charge chamber intermediate the inner walls of the housing and the heating means, and a contained elastic tubular lining adjacent to and spaced from the inner walls, whereby the lining is hydrostatically motivated to compress a contained quartz powder charge in the charge chamber in the direction of the heating means.

3,674,905

TEACHING AID

James W. Collins, Sr., 400 N.W. Fifth Street, Mineral Wells, Tex.

Filed April 22, 1970, Ser. No. 30,659
Int. Cl. G09b *19/00*
U.S. Cl. 35—35 G **6 Claims**



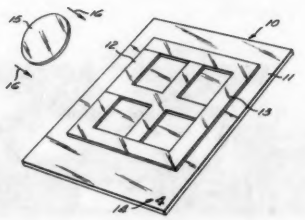
A windowed housing internally supports a removable rod that mounts a series of concentrically positioned wheels having indicia thereon which appear through the windows. Detent means between the wheels and the housing permit the selective positioning of the wheels such that particular indicia remain in view through the windows. Brackets are provided in the interior of the housing to slidably mount the rod thereby permitting rapid removal and replacement of the rod. Removal of the rod allows rapid rearrangement of the wheel order on the rod.

3,674,906

EDUCATION DEVICE EMPLOYING POLARIZED PLASTIC MATERIAL

Edward L. Warren, 6333 Stafford Drive, North Olmsted, Ohio

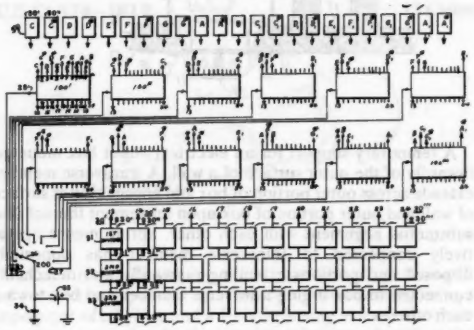
Filed May 11, 1970, Ser. No. 36,094
Int. Cl. G09b *3/00*
U.S. Cl. 35—48 R **8 Claims**



A method and apparatus are disclosed for transmitting information from a first person to a second person while precluding transmission of the information to other persons. A first polarizing area and a second polarizing area are arranged such that their directions of polarization are angularly related. The first and second polarizing areas are displayed by the first person for visual perception by the second person, and light is passed through the first and second polarizing areas. A polarizing means is provided for blocking light received from

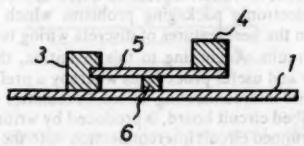
one of the polarizing areas and for permitting light received from the other of the polarizing areas to pass therethrough so that the information is transmitted only to the second person when the second person views the first and second polarizing areas through the polarizing means. In a first and second embodiment, the first polarizing area is arranged in a first predetermined pattern corresponding to the information to be transmitted, and the second polarizing area cooperates with the first polarizing area to form a second predetermined pattern. In a third embodiment, the first polarizing area is positioned to cover the information that is to be transmitted and the second polarizing area is positioned to cover other information.

3,674,907
KEYBOARD TRANSPOSITION OF ELECTRICAL MUSICAL INSTRUMENTS
Wendell A. Derry, 419 High Street, Randolph, Mass.
Filed , Ser. No. 199,474
Int. Cl. G10h *1/00*
U.S. Cl. 84—1.01 **7 Claims**



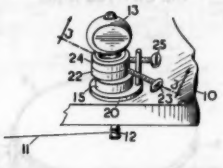
The keyboard of musical instruments, such as electronic organs, is connected through frequency divider circuits to basic tone generators such that corresponding keys of adjacent octaves produce notes which are separated by an octave and adjacent keys produce the tonal scale. This invention discloses electronic switching which allows all keys to be moved up or down the tonal scale in unison by connecting different tone generators to the frequency divider networks according to the key in which the music is to be provided while the music may be played on the keyboard from sheet music written in a different key.

3,674,908
PIANO SOUNDING BOARD ASSEMBLY
Ingo Ludemann, Hamburg, Germany, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Japan
Filed April 26, 1971, Ser. No. 137,465
Claims priority, application Japan, Aug. 28, 1970, 45/74936
Int. Cl. G10c *3/04*
U.S. Cl. 84—212 **8 Claims**



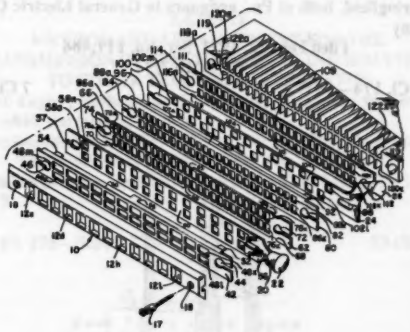
There is described a piano sounding board assembly whereby the vibration from the bass bridge may be effectively transmitted and distributed to the open area of the sounding board and the tonal qualities in the bass range may be improved to a considerable extent, the sounding board assembly incorporating a connecting plate member adapted for directly interconnecting the bass and treble bridges on one side of the sounding board.

3,674,909
PITCH CHANGE LIMITING DEVICE FOR STRINGED MUSICAL INSTRUMENTS
Joseph Peters, Jr., 2105 Lyde Place, Scotch Plains, N.J., and Brian P. Feeney, 2803 2nd Street, Santa Monica, Calif.
Filed July 6, 1970, Ser. No. 52,621
Int. Cl. G10d *3/14*
U.S. Cl. 84—312 **4 Claims**



A pitch changing device for string instruments comprising an adapter cylinder rigidly mounted on the tuning key shaft, an upper ring rotatably mounted on the adapter cylinder, a lower ring rotatably mounted on the upper ring, and a limit stop rigidly mounted on the instrument head. The device enables the user to limit the rotational motion of the tuning key shaft to a predetermined angular value.

3,674,910
CHROMATIC HARMONICA
James G. McKenzie, P.O. Box 1982, Orange, Calif.
Filed June 17, 1970, Ser. No. 47,010
Int. Cl. G10d *7/12*
U.S. Cl. 84—377 **9 Claims**



A chromatic harmonica employing a pair of independently movable, manually actuated valve slides with predetermined patterns of lands and apertures formed therein. Such slides are disposed behind the mouthpiece and before the comb and reed plates in the path of flow for the breath expelled by the person playing this instrument. The comb and reed plate is designed so that each cell in the comb is subdivided into a plurality of wind cells with a separate reed for each wind cell, and four wind cells are exposed to each opening in the mouthpiece of the harmonica. By proper manipulation of the pair of valve slides three of the four wind cells operatively associated with each opening are blocked by appropriate lands in the slides; thus, only the single reed within the selected wind cell is

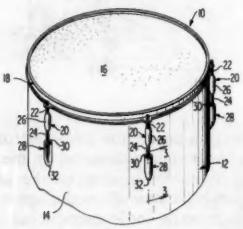
placed in communication with the mouthpiece to receive the breath expelled thereinto. Consequently, with this unique configuration of coacting elements, the instant harmonica may be played in a unidirectional, "all-blow," or "all-draw" fashion approximating the operation of a woodwind instrument. Furthermore, such harmonica is capable of producing all of the notes of the chromatic scale with a more nearly consistent smoothness of transition from one note to the next, and more trills are available.

3,674,911

DRUM BODY HAVING INTEGRAL MOUNTING LUGS FOR DRUMHEAD TENSIONING APPARATUS

Kenneth W. Phillips, and Iris L. Phillips, both of 2050 Perkins Drive, Springfield, Ohio

Filed Dec. 8, 1970, Ser. No. 96,154
Int. Cl. G10d *13/02*
U.S. Cl. 84—411 **8 Claims**



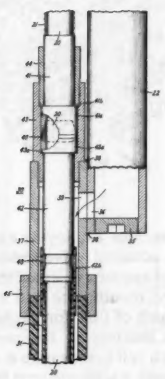
A drum body comprising a hollow shell member and a plurality of protuberant lugs forming mounting lugs for drumhead tensioning apparatus. The lugs and member are joined as an integral unit.

3,674,912

CABLE CONNECTION FOR WATER COOLER UNDERGROUND ELECTRODE

Charles H. Titus, Newtown Square, and Harold N. Schneider, Springfield, both of Pa., assignors to General Electric Company

Filed Feb. 22, 1971, Ser. No. 117,488
Int. Cl. H01b *7/34*
U.S. Cl. 174—15 C **7 Claims**



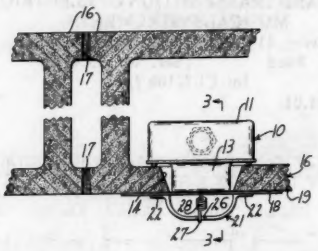
A high power fluid cooled electric cable conduit is fixed in laterally offset axially overlapping relation to a fluid supply conduit with registering fluid passage ports in adjacent side walls thereof. The fluid supply conduit is closed at its overlapping end and an electric cable is introduced axially into the cable conduit through its overlapping end and in sealed relation therewith, the fluid supply ports being located between such overlapping ends of the conduits.

3,674,913

TEMPORARY SUPPORT FOR ELECTRICAL OUTLET BOX

Kenneth Yates, Vinemont, Ala., assignor to Donald B. Allison, Vinemont, Ala., a part interest

Filed July 9, 1971, Ser. No. 161,008
Int. Cl. H02g *3/12*
U.S. Cl. 174—48 **5 Claims**



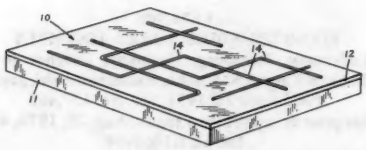
A temporary support for an electrical outlet box mounted inwardly of the outer surface of a wall. A transverse member extends across outer portion of box and engages outer surface of wall and outer portion of box upon movement thereof into substantial alignment with each other. Spring means operatively connected to transverse member has oppositely disposed end portions extending outwardly and detachably connected to box urging transverse member and box toward each other.

3,674,914

WIRE SCRIBED CIRCUIT BOARDS AND METHOD OF MANUFACTURE

Robert Page Burr, Huntington, N.Y., assignor to Photocircuits Corporation, Glen Cove, N.Y.

Continuation-in-part of Ser. No. 704,383, Feb. 9, 1968, abandoned, which is a continuation-in-part of Ser. No. 628,701, April 5, 1967, abandoned. This application March 5, 1970, Ser. No. 16,742
Int. Cl. H05k *3/20*
U.S. Cl. 174—68.5 **13 Claims**



The present invention represents a new approach to solving modern electronic packaging problems which combines in one system the best features of discrete wiring techniques and printed circuits. According to this invention, there are provided new and useful procedures whereby a prefabricated organized wire interconnecting device, hereinafter referred to as a wire scribed circuit board, is produced by writing or plotting a predetermined circuit interconnection onto the surface of an insulating base using as the writing medium or "ink" a continuous wire filament. The wire is fed onto the surface of the base continuously from one side thereof, simultaneously affixed to the base to form the interconnecting pattern, and cut

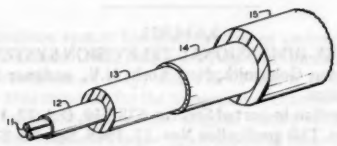
at the finish of each line, to thereby form a written wire image of a predetermined interconnecting pattern on the base. Preferred embodiments of the wire scribed boards include a wire image of a predetermined interconnecting pattern in which wire conductors exhibit inflection points produced solely as a result of the writing technique and/or crossovers in essentially the same plane as the wire, as well as connection terminals to which the written wire lines and/or electrical components may be attached. The boards resemble a printed circuit board in appearance and cubic packing potential, although no art work or graphic processes of any kind are employed in their production. Unlike printed circuit boards, repairs as by conductor additions or deletions or modifications may be readily made.

3,674,915

ELECTRICAL CABLE HAVING AN ETHYLENE-1-OLEFIN COPOLYMER AS THE DIELECTRIC MATERIAL

James E. Pritchard, Bartlesville, Okla., assignor to Phillips Petroleum Company

Filed June 1, 1971, Ser. No. 148,392
Int. Cl. H01b 9/04
U.S. Cl. 174—102 R **12 Claims**



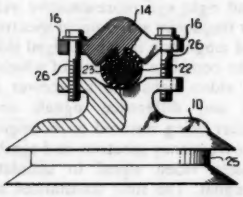
An electrical cable having at least two spaced apart electrical conductors separated by a dielectric material comprising a copolymer of ethylene and a 1-olefin having at least three carbon atoms per molecule, the copolymer having a density in the range of about 0.928 to about 0.945 and the dielectric material having a dielectric constant of less than about 2.325, a dielectric dissipation factor of less than about 55 microradians at 30 megahertz, and an environmental stress cracking resistance of at least 800 hours.

3,674,916

INSULATOR WITH CONDUCTOR PIERCING CLAMP FOR INSULATED CABLE

Dominick W. Langella, 12 Kendrick Lane, Dix Hills, N.Y.

Filed March 16, 1971, Ser. No. 124,848
Int. Cl. H01b 17/16
U.S. Cl. 174—169 **2 Claims**



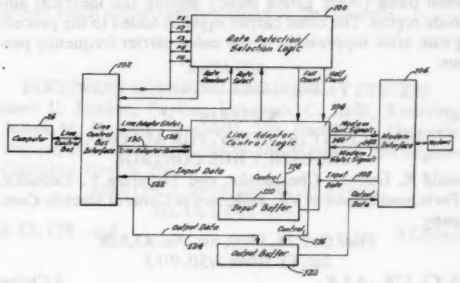
A clamp for securing an insulated or covered cable to a pole insulator. The clamp has provision for piercing the insulation of the cable and thereby directly connecting the clamp to the conductor of the cable, averting radio frequency discharges between the conductor and the clamp.

3,674,917

FREQUENCY SELECTING SYSTEM

William N. Myers, Jr., Huntington Beach, Calif., assignor to American Micro-Systems, Inc., Santa Clara, Calif.

Filed Feb. 24, 1971, Ser. No. 118,396
Int. Cl. H04l 15/00
U.S. Cl. 178—2 R **14 Claims**



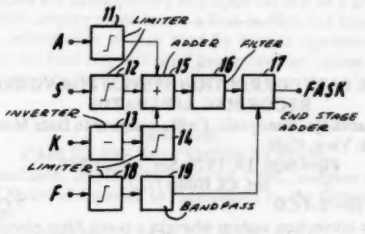
This invention relates to a computer system for selecting the rate of presentation of a plurality of digital signals from a particular number of rates stored in the computer. During a particular number of digital signals such as the first two digital signals in a sequence, clock signals are introduced to a counter. Every time that the counter overflows, the frequency of the clock signals is reduced by an arithmetic factor and a count is inserted into the counter in accordance with the reduction in the frequency of the clock signals. At the end of the particular number of digital signals, the computer determines the rate of the digital signals from the count in the counter and the frequency of the clock signals and selects, from the particular number of rates stored in the computer, the rate closest to the determined rate. The computer then resets the count in the counter and selects the frequency of the clock signals in accordance with the selected rate of the digital signals.

3,674,918

METHOD AND ARRANGEMENT FOR THE TRANSMISSION OF SYNCHRONIZING INFORMATION TO COLOR TELEVISION APPARATUS

Ernst Legler, Seeheim a. d., Germany, assignor to Fernseh GmbH, Darmstadt, Germany

Continuation of Ser. No. 780,368, Dec. 2, 1968, abandoned. This application March 2, 1971, Ser. No. 120,371
Claims priority, application Germany, Dec. 1, 1967, P 15 37 104.7
Int. Cl. H04n 9/44
U.S. Cl. 178—5.2 R **23 Claims**



A method and arrangement for the transmission of synchronizing information to color television apparatus, particularly when operated in accordance with the PAL (V-axis) color television system. The required synchronizing signals are

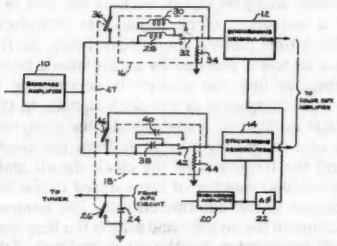
all combined within one signal which is then transmitted over a single video transmission line to the color television apparatus. The four required synchronizing signals are the blanking signal, the sync signal, the registration pulse (burst gating pulse) of the color sync signal, and the color carrier signal. The blanking signal and the sync signal are added with identical polarity, whereas the registration pulse (burst gating pulse) of the color sync signal is added with opposite polarity and with equal amplitude. The blanking signal and the registration pulse (burst gating pulse) assume the identical amplitude region. The color carrier signal is added to the preceding sum after suppression of the color carrier frequency portions.

3,674,919

DISABLING CIRCUITRY, FOR AUTOMATIC FREQUENCY HUE CONTROL

Donald E. Garrett, Chesapeake, and Theodore V. Zaloudek, Portsmouth, both of Va., assignors to General Electric Company

Filed Oct. 26, 1970, Ser. No. 83,828
Int. Cl. H04n *5/50, 9/12*
U.S. Cl. 178—5.4 R **5 Claims**



First and second selector switch means are provided for adding or subtracting reactive elements from phase shift circuits which supply chroma signals to the demodulator stages of a color television receiver. First and second disabling switch means are placed in shunt with the reactive elements and associated switch means for disabling the phase shift circuits during fine adjustment of various controls by a viewer. A third disabling switch is provided for removing a bias provided by an automatic frequency control module from the tuner stage of the receiver. All three disabling switches are linked together for simultaneous operation such that tuning and color signal control circuitry is disabled to allow the receiver to be adjusted manually. The disabling switches may then be opened, allowing the automatic frequency control and phase shifting circuits to resume their functions.

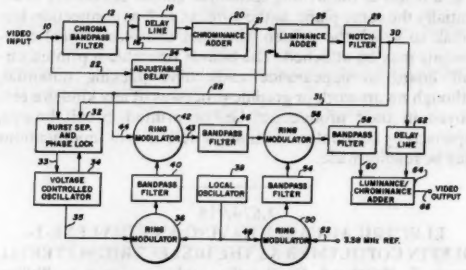
3,674,920

TIME BASE CORRECTION SYSTEM FOR VIDEO RECORDING APPARATUS

Yves C. Faroudja, Sunnyvale, Calif., assignor to Data Memory, Inc., Mt. View, Calif.

Filed Sept. 14, 1970, Ser. No. 71,845
Int. Cl. H04n *1/22*
U.S. Cl. 178—5.4 CD **7 Claims**

A color correction system wherein a comb filter circuit and a heterdyne circuit are operatively interrelated to provide time base correction with de minimis reduction in luminance information. The comb filter portion of the circuit provides for the extraction and separation of chrominance and luminance information while the heterodyne portion provides time base correction of the unstable chrominance information. After stabilization, the chrominance signal is recombined



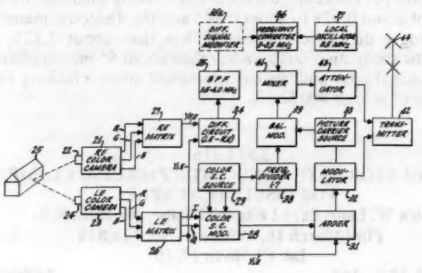
with the luminance signal to reconstitute the composite video output signal.

3,674,921

THREE-DIMENSIONAL TELEVISION SYSTEM

Alfred Norton Goldsmith, New York, N.Y., assignor to RCA Corporation

Continuation-in-part of Ser. No. 678,710, Oct. 27, 1967, abandoned. This application Nov. 12, 1969, Ser. No. 875,796
Int. Cl. H04n *9/60*
U.S. Cl. 178—5.4 R **28 Claims**



The high frequency difference between the complete respective left and right eye representative video signals is shifted to the low frequency video signal spectrum and transmitted at reduced amplitude in the vestigial sideband of the picture carrier, the complete sideband of which conveys one of the complete video signals to a receiver at which the complete video and difference signals are separately recovered, the latter being restored to its original amplitude and position in the frequency spectrum and combined with the recovered complete video signal to simulate the other complete video signal. The fully transmitted and recreated video signals are employed to produce two horizontally interleaved images on the screen of a cathode ray tube for viewing through vertical lenticulations. The difference signal may be modified before transmission to compensate for certain anomalous optical effects and/or to create a desired psychophysical effect in the picture reproduced by the cathode ray tube.

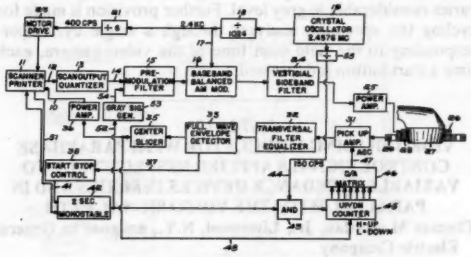
3,674,922
SYNCHRONIZED OR UNSYNCHRONIZED PARTIAL RESPONSE BINARY SIGNALLING

Roy G. Salaman, and John B. Picchiottino, both of Boulder, Colo., assignors to Phonocopy, Inc., Wilmington, Del.

Continuation of Ser. No. 719,062, April 5, 1968, abandoned, which is a continuation-in-part of Ser. No. 579,591, Sept. 15, 1966, abandoned. This application Jan. 19, 1971, Ser. No. 107,866

Int. Cl. H04b *1/66, 3/14;* **H04l** *27/00*

U.S. Cl. 178—6 **15 Claims**



A transmission system for synchronized or unsynchronized non-return to zero (NRZ) binary waves with minimum time between transitions of $1/Kf_1$ where $K<2$ and f_1 is the upper frequency zero response for the transmission channel utilizes a center threshold to recover the original binary NRZ stream from a partial response binary signal resulting from transmission of the NRZ binary through the narrow band channel. The partial response binary signal transmitted is obtained from the original NRZ binary signal of signal shaping in accordance with an amplitude function of:

$$A(f)=\frac{\pi f}{2f_1}\cot\frac{\pi f}{2f_1}$$ and a linear phase characteristic.

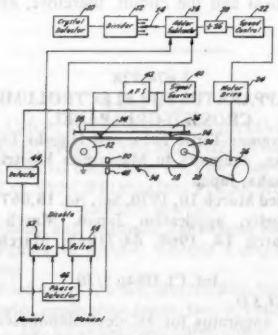
3,674,923
FACSIMILE SYSTEM WITH IMPROVED SCANNING

Thomas H. Gifft, Anaheim, Calif., assignor to T. H. Gift Co., Inc., Anaheim, Calif.

Filed June 30, 1969, Ser. No. 837,545

Int. Cl. G01d *15/06, 15/24;* **H04n** *1/22*

U.S. Cl. 178—6.6 R **11 Claims**



A facsimile system includes means to add or subtract control pulses or means to control a voltage controlled oscillator to provide for the proper visual orientation of the facsimile on the facsimile paper. The addition or subtraction of pulses may be accomplished manually or may be accomplished automatically using the phase detector to determine the proper orientation of the visible facsimile. The control of the voltage controlled oscillator may also be accomplished using a phase detector. The invention also includes an automatic frequency selector to provide that the amplitude of the signal applied to the facsimile system has a linear relationship with frequency of the input signal so as to produce the proper facsimile reproduction. The invention also includes the use of a canted roller system to insure that the facsimile paper has the proper tension to prevent shrinkage of the paper which again insures a proper visual output representation of the facsimile.

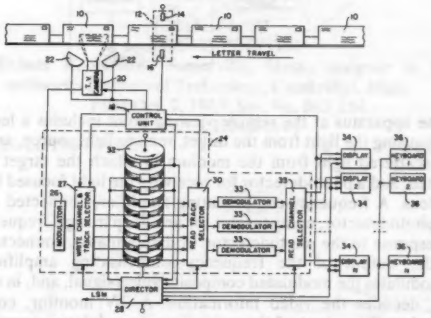
3,674,924
DOCUMENT SCANNING AND DISPLAY SYSTEM

Robert E. Fischer, Dayton; Lawrence C. Raiff, Kettering; James M. Seybold, Trotwood, and Donald F. Zimmerle, Dayton, all of Ohio, assignors to The National Cash Register Company, Dayton, Ohio

Filed Oct. 2, 1970, Ser. No. 77,640

Int. Cl. H04n *7/18*

U.S. Cl. 178—6.8 **3 Claims**



A system for scanning a moving document and displaying a still image of the document without physically impeding the travel of the moving document. The documents, which may contain human-readable information thereon, are caused to be successively transported past a television camera positioned in a darkened chamber, with the document side containing the readable information oriented towards the television camera. Timed control pulses cause flash lamps, also housed in the darkened chamber, to be momentarily energized, thus bathing the document in a bright flash of light at a time when the document is positioned within the television camera's field of view. The light image formed by the document is stored in the form of charged picture elements on the television camera's light-sensitive screen. These charged picture elements are then electronically scanned for generating video signals, which are stored in a storage device. The stored video signals are subsequently displayed on one of a plurality of television display monitors on a first-in, first-out basis. The readable information is then read by human operators who determine the final disposition of the documents whose image is being currently displayed on a television monitor.

3,674,925
CABLE-LESS TELEVISION SYSTEM

Paul J. Heckman, Jr., Rancho Santa Fe, Calif., assignor to The United States of America as represented by the Secretary of the Navy

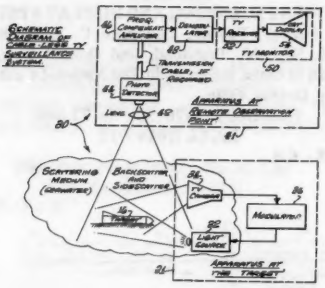
Filed Dec. 3, 1970, Ser. No. 94,659

Int. Cl. H04n *7/02*

U.S. Cl. 178—6.8 **12 Claims**

This invention relates to apparatuses and methods for enabling surveillance of a distant target from a remote viewing point which does not require a cable or acoustic signals

between the target and the viewing point. The apparatus at the target includes a light source, for example, a laser, for illuminating the target, and which may be modulated by any of various known techniques, at a frequency in the range of 3 kHz or more. A TV camera tube, which observes the target, generates a conventional composite video signal, including horisontal and vertical blanking pulses, the bandwidth of the video system being at least 50 kHz. A light source modulator connected between the light source and the TV camera tube, modulates the light source in accordance with the variation in amplitude of the composite video signal.



The apparatus at the remote viewing point includes a lens for focusing the light from the target, remote light source, and any scattered light from the medium in which the target is located, and a photodetector for receiving the light focused by the lens. A frequency-compensating amplifier, connected to the photodetector, compensates for any drop in high-frequency response to the photodetector. A demodulator, connected to the output of the frequency-compensating amplifier, demodulates the modulated composite video signal, and, in effect, decodes the video information. A TV monitor, connected to the output of the pulse-time demodulator, permits observing the target at the viewing point remote from the target.

3,674,926

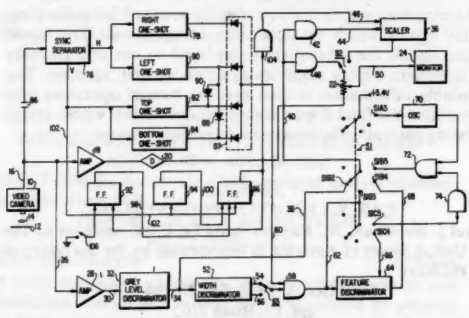
FEATURE COUNTER WITH IMPROVED MASKING AND GREY LEVEL DETECTION

Raymond D. Dewey, Bon Air; Robert S. Mapes, and Garth S. Jones, both of Richmond, all of Va., assignors to Reynolds Metals Company, Richmond, Va.

Continuation-in-part of Ser. Nos. 767,614, Oct. 15, 1968, Pat. No. 3,578,904, and Ser. No. 848,474, Aug. 8, 1969, Pat. No. 3,579,249. This application Feb. 11, 1971, Ser. No. 114,456

Int. Cl. H04n 7/18

U.S. Cl. 178—6.8 **10 Claims**



A specimen analyzer including a video camera for scanning a specimen and selectively counting features thereof on the basis of grey level and/or size. The device may operate in several modes to count only features darker (or lighter) than the selected grey level, to count only features that are darker than a first grey level but lighter than a second grey level, to count only features wider than a selected width, to count only features wider than a first width but not as wide as a second width, or to count features that meet more than one of these tests. A variable electronic mask permits the operator to select any area of the specimen within the view of the camera for features analysis without moving the specimen. Check spot pulses are generated for each featured counted and these may be displayed on a video monitor superimposed on a video display of the specimen. Provision is made for background compensation when counting features against the background that varies considerably in grey level. Further provision is made for cycling the specimen analyzer through a single cycle, corresponding to the field scan time of the video camera, each time a start button is depressed.

3,674,927

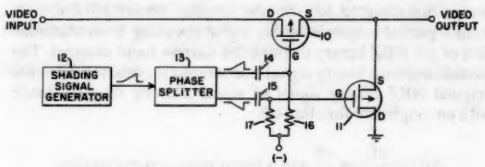
VIDEO SHADING MODULATOR WITH PARAPHASE CONTROL SIGNALS APPLIED RESPECTIVELY TO VARIABLE IMPEDANCE DEVICES IN SERIES AND IN PARALLEL WITH THE VIDEO SIGNAL PATH

Thomas M. Jordan, Jr., Liverpool, N.Y., assignor to General Electric Company

Filed March 16, 1971, Ser. No. 124,777

Int. Cl. H04n 5/40

U.S. Cl. 178—7.2 **6 Claims**



To correct for degrading optical and pickup tube effects, amplitude of a video signal is varied by a shading signal. The shading signal is furnished to the input of a phase splitter and the resulting signals of opposite phase are furnished to respective gates of a pair of closely matched, variable impedance devices, such as field effect transistors, one such device being connected in series with the video signal path and the other such device being connected in shunt with the video signal path. By using matched field effect transistors as the variable impedance devices, their quiescent output resistances are substantially identical and the circuit, therefore, exhibits symmetry.

3,674,928

SCANNING APPARATUS FOR ELECTROLUMINESCENT CROSSED-GRID PANEL

Masami Yoshiyama; Teruo Sato, and Hitoshi Takeda, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed March 10, 1970, Ser. No. 18,067

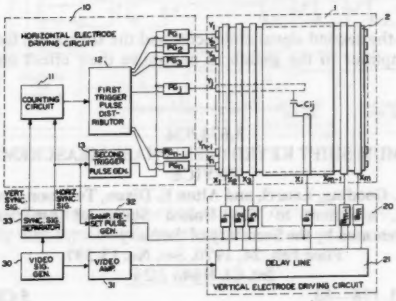
Claims priority, application Japan, March 14, 1969, 44/21067; March 14, 1969, 44/21068; March 14, 1968, 44/21069

Int. Cl. H04n 5/70

U.S. Cl. 178—7.3 D **3 Claims**

A scanning apparatus for an electroluminescent crossed-grid panel having a multiplicity of electroluminescent elements at the intersections of horizontal and vertical electrodes. The scanning apparatus has a horizontal electrode driving circuit adapted to be coupled to said horizontal electrodes and having a set of pulse generators for supplying a selecting pulse to a horizontal electrode to be scanned sequentially in response to a synchronizing signal of a video signal

and for supplying the remaining horizontal electrodes at the same time with blanking pulses which are in phase with said selecting pulse and have an amplitude less than one-half of said selecting pulse. A video signal supply means is coupled to said horizontal electrode driving circuit for supplying the synchronizing signal of the video signal. A vertical electrode driving circuit is provided which has a set of brightness control circuits, each of which includes a transistor having the collector thereof adapted to be connected to a corresponding vertical electrode. A circuit for supplying a multi-channel video signal is connected to the base of each said transistor, and a delay means is provided having a delay time corresponding to one horizontal period of the video signal and has taps connected to associated brightness control circuits. A sample reset signal generator is coupled to said brightness control circuits and to said video signal supply means for supplying a sample signal and a reset signal to said brightness control circuits in response to synchronizing signals of a video signal. The video signal supply means is coupled to said vertical electrode driving circuit for supplying an amplified video signal to the input terminal of said delay means. By means of this apparatus each of said electroluminescent elements along the horizontal electrode to be scanned is simultaneously controlled with respect to the brightness thereof by varying the collector resistance of each of said transistors in response to the multi-channel video signals which are sampled at each tap of said delay means at the same time.



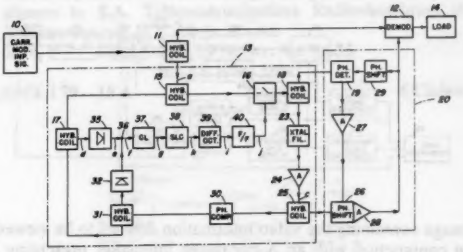
3,674,929

DEMODULATION SYSTEM REGENERATING CARRIER WAVES PHASE SYNCHRONIZED WITH CORRESPONDING CARRIER WAVE COMPONENTS IN HORIZONTAL SYNCHRONIZING PULSE MODULATED CARRIER WAVES

Susumu Akiyama, and Mitsuaki Naganuma, both of Tokyo, Japan, assignors to Nippon Electric Company, Limited, Tokyo, Japan

Filed Oct. 17, 1969, Ser. No. 867,306
Claims priority, application Japan, Dec. 9, 1968, 43/89729
Int. Cl. H04n *5/44*; H04b *1/68*
U.S. Cl. 178—7.3 R **10 Claims**

A receiver for a vestigial sideband television signal having a low excess carrier ratio regenerates the carrier for demodulation of that signal by means of a sampling gate and a filter. The sampling gate samples the received signal during the synchronizing intervals therein under control of a gate signal which is developed by the subtraction of the envelope of the regenerated carrier from the envelope of the in phase sum of the regenerated carrier and the received signal. The regenerated carrier is supplied to the demodulator through an Automatic Phase Control system.

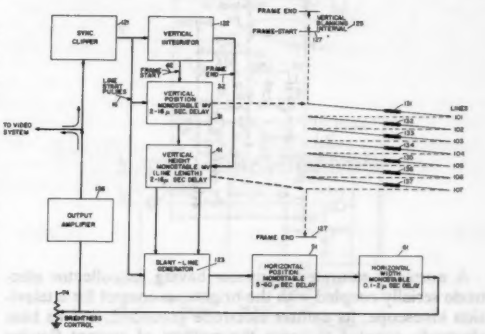


3,674,930

VIDEO POINTER

Michael R. Monett, Somerville, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Oct. 2, 1969, Ser. No. 863,154
Int. Cl. H04m *5/44*
U.S. Cl. 178—7.5 R **8 Claims**



A line or rectangle is superimposed on a video picture to direct attention to features of the picture and to indicate heights and angles of lines in the picture. Video signals are sampled to provide synchronizing triggers to timing circuits. Four timing circuits define the vertical position and height, and horizontal position and width of the rectangle or line. One additional timing circuit defines the angle the line makes with the vertical, permitting slanted lines or diamond shapes. The pulses which form the line, rectangle or diamond shape are fed back to the video system on the same cable which brought the composite signal to the hand-held video pointer circuitry.

3,674,931

DARK CURRENT CLAMP FOR TELEVISION CAMERA WITH A CIRCULAR FIELD OF VIEW PERMITTING MAXIMUM UTILIZATION OF VIDICON TARGET

James A. Fazio, Liverpool, N.Y., and William H. Wesbey, New Berlin, Wis., assignors to General Electric Company

Filed Dec. 8, 1969, Ser. No. 883,101
Int. Cl. H04n *5/18*
U.S. Cl. 178—7.1 DC **12 Claims**

A vidicon camera, operated in an overscan condition in order to obtain high resolution and sensitivity, employs a mask around the periphery of the target. Dark current clamp cir-

cuitry is made dependent on target current in the masked region, with the clamp pulse generated only at a time when the beam is sensing the portion of the target behind the mask so as to avoid producing horizontal streaks in the portion of the

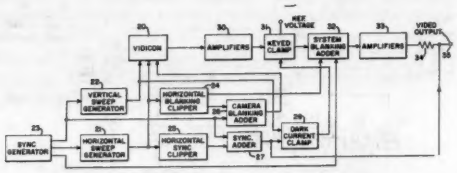


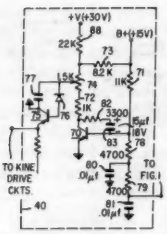
image containing the video information desired to be viewed. In conjunction with an X-ray image intensifier presenting a circular display, a circular ring-shaped mask permits a maximum amount of information to be viewed.

3,674,932

AUTOMATIC BEAM CURRENT LIMITER

Dal Frank Griepentrog, Indianapolis, Ind., assignor to RCA Corporation

Filed Feb. 16, 1971, Ser. No. 115,473
Int. Cl. H04n *5/19, 5/58*
U.S. Cl. 178—7.5 R **11 Claims**



A normally saturated transistor having its collector electrode serially coupled with the brightness control for a television kinescope, its emitter electrode grounded, and its base electrode coupled to sense the amount of current flowing through such device is effective to dynamically adjust the direct current bias of the video signal chain when that current exceeds a predetermined value, with the change in bias being in an offsetting direction to reduce the kinescope drive. Such an arrangement proves advantageous in eliminating the need for a brightness limiter control potentiometer—of the type utilized in U.S. Pat. No. 3,541,240, for example—which, though normally pre-set prior to delivery of the receiver to a purchasing customer, could become misadjusted and result in damage to the television picture tube.

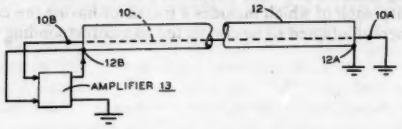
3,674,933

COMMUNICATIONS CABLES HAVING REDUCED INTERFERENCE CHARACTERISTICS

Walter Karl-Theodor Baum, Leyherstrasse 15, and Otto Breitenbach, Backlerstrasse 25, both of 85 Nurnberg, Germany

Filed Nov. 5, 1969, Ser. No. 874,225
Claims priority, application Germany, Nov. 7, 1968, P 18 07 408.3
Int. Cl. H04b *3/32*
U.S. Cl. 178—69 B **8 Claims**

A communications cable comprising a core with at least a first and a second signal conductor and a sheath of conductive material. The first signal conductor carries the communication signals. The input of an amplifier is connected to the second signal conductor while the output of the amplifier is connected at least to the sheath so that any voltages developed



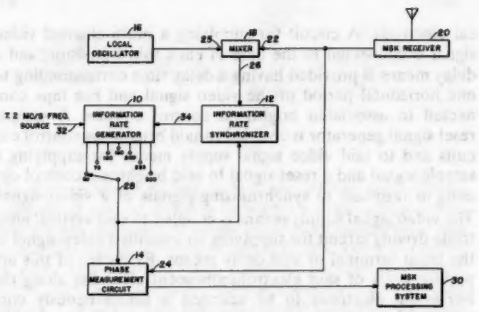
across the second signal conductor and the sheath are fed via the amplifier to the sheath to neutralize their effect on the core.

3,674,934

MINIMUM SHIFT KEYED (MSK) PHASE MEASUREMENT DEVICE

Otis E. Gooding, Laurel, and Alton E. Dixon, Townson, both of Md., assignors to The United States of America as represented by the Secretary of the Navy

Filed Feb. 24, 1970, Ser. No. 13,397
Int. Cl. H04b *1/26*
U.S. Cl. 178—88 **5 Claims**



Apparatus for measuring the phase of an unsynchronized but phase continuous and stabilized Minimum Shift Keyed (MSK) signal by monitoring the data channels of an MDK data communication system. This is accomplished by a phase synchronization and measurement technique that compensates for the phase shifts introduced from the MSK modulation scheme. Thus, time-varying phase changes caused by propagation effects are determinable.

3,674,935

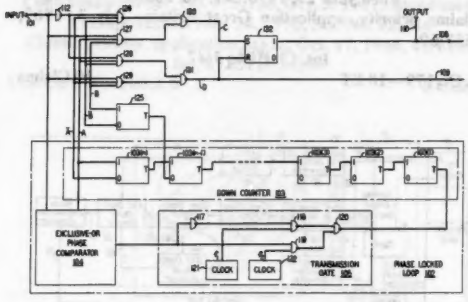
DIGITAL CIRCUIT DEMODULATOR FOR FREQUENCY-SHIFT DATA SIGNALS

Thomas Russell Lawrence, Leonardo, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 7, 1970, Ser. No. 78,696
Int. Cl. H04l *27/14*
U.S. Cl. 178—88 **10 Claims**

FSK data signals are applied to a digital phase-locked loop having a countdown feedback circuit producing a signal wave which leads or lags the phase of the data signal by an angle which is dependent on the frequency of the data signal. The countdown circuit also generates a second signal wave which lags the phase of the feedback wave by a fixed angle. The

unique permutations of concurrent amplitudes of the three signals are processed by sets of gates to recover the baseband



signal. Counters monitor the outputs of the gates to detect steady tone signals and loss of carrier.

3,674,936

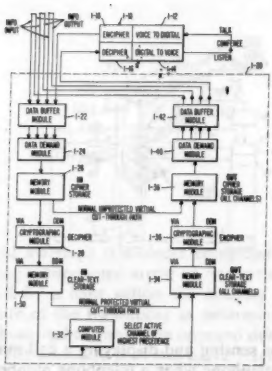
VOICE CONFERENCE SYSTEM

Fred G. Wolfe, Malvern, Pa., assignor to Burroughs Corporation, Detroit, Mich.

Continuation of Ser. No. 625,067, March 22, 1967, abandoned. This application Feb. 26, 1970, Ser. No. 14,771

Int. Cl. H04m 3/16

U.S. Cl. 179—1.5 R **6 Claims**



The present application discloses a voice conference system which may be utilized to provide virtual cut-through (VCT) service when used in conjunction with a modular data processor in a store and forward message switching system. The virtual cut-through service so provided allows the transmission of continuous traffic as well as digital voice communications. This feature coupled with other novel characteristics of the system make it possible to implement an extremely effective secure voice conference service.

3,674,937

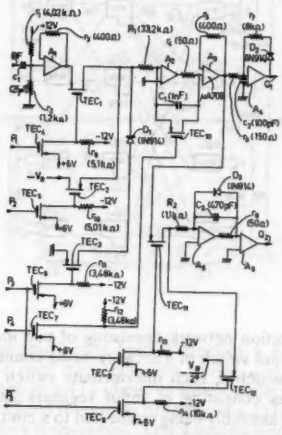
TRANSMISSION DEVICE FOR THE TRANSMISSION OF ANALOG SIGNALS BY MEANS OF PULSE CODE MODULATION

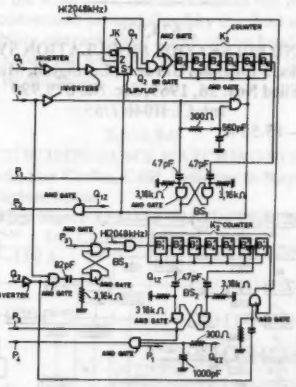
Maurice Georges Bellanger, Antony; Jacques Lucien Daguet, St. Maur, and Tuan Kiet Duong, Velizy, all of France, assignors to S.A. Telecommunications Radioelectriques et Telephoniques T.R.T., Paris, France

Filed Feb. 2, 1970, Ser. No. 7,635

Int. Cl. H04j 3/04

U.S. Cl. 179—15 A **6 Claims**





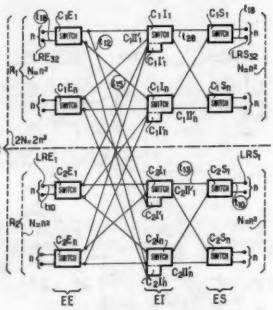
A transmission device for the transmission of analog signals by means of pulse code modulation, particularly in time-division multiplex systems wherein for the purpose of generating the PCM signals the analog signals are applied through a duration modulating device to a counter controlled by clock pulses.

In order to reduce the counting speed and the dynamic range of the comparator the duration modulating device is provided with two integrating networks having mutually greatly different time constants for pulse-duration modulation in accordance with four different slopes, each integrating network being connected to a counter controlled by clock pulses which counters provide the pulses of the greatest weight and of the smallest weight, respectively, of the code group characterized by the analog signal.

3,674,938
EXPANDED MULTI-STAGE TIME CONNECTION NETWORK

Jean-Baptiste Jacob, Saint-Quay Perros, France, assignor to C.I.T.-Compagnie Industrielle Des Telecommunications, Paris, France and Societe Lannionaise D'Electronique, Lannion, France

Filed Dec. 29, 1970, Ser. No. 102,371
Claims priority, application France, Dec. 29, 1969, 6945219
Int. Cl. H04j 3/08; H04q 3/42
U.S. Cl. 179—15 AQ 8 Claims

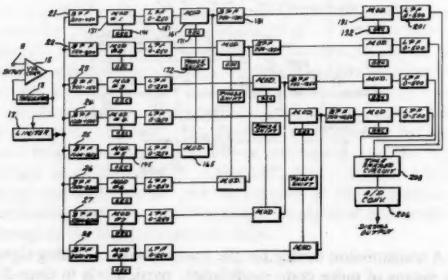


Time connection network consisting of two identical networks, each input switch of a network being connected to the intermediate switches, each intermediate switch comprising two assemblies consisting of input registers and a buffer memory, each assembly being connected to a control memory and to the same output registers.

3,674,939
BASEBAND PULSE CODE MODULATION SYSTEM

Fred A. Brooks, 5 Emerson Gardens, Lexington, Mass.

Filed Nov. 26, 1969, Ser. No. 879,999
Int. Cl. H04b 1/66
U.S. Cl. 179—15.55 R 2 Claims

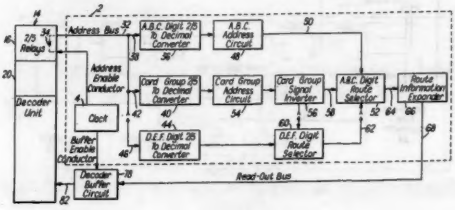


Pulse code modulation system for reducing bandwidth in which voice signal input is compressed, limited, filtered into frequency channels, all of which are converted to the same baseband frequency and are fed to a time sharing multiplexing circuit followed by an analog to digital circuit for transmission. The digital signal is received, converted to analog, demultiplexed, demodulated to voice frequency channels and bandpass filtered. The number of channels applied to the time sharing circuit can be reduced by common band occupancy quadrature carrier methods and then converted to baseband.

3,674,940
TELEPHONE TRANSLATOR APPARATUS

Derek Leyburn, Mississauga, Ontario; Bernard R. Montague, Dollard Des Ormeaux, Quebec, and Henry K. Mattila, Roxboro, Quebec, all of Canada, assignors to Bell Canada, Montreal, Quebec, Canada

Filed June 29, 1970, Ser. No. 50,808
Claims priority, application Great Britain, July 3, 1969, 33,657/69
Int. Cl. H04q 3/47
U.S. Cl. 179—18 ET 10 Claims

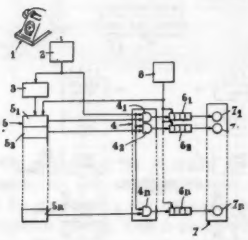


Telephone translator apparatus including an integrated circuit translator unit for translating input codes each made up of a number of code digits into translations each made up of a number of information bits and a plurality of decoder stages to initiate a direct route connection and capable of providing an alternate route when a direct route is not available, the integrated circuit translator unit being selectively connected, in turn, to the output of each decoder stage.

3,674,941
CALL-NUMBER MONITORS FOR TELEPHONES

Guy Claude Guetta, 12 Place d'Anuers, Paris, 9, France

Filed June 1, 1970, Ser. No. 42,129
Claims priority, application France, June 1, 1970, 6918008
Int. Cl. H04m 1/56
U.S. Cl. 179—90 AN 15 Claims

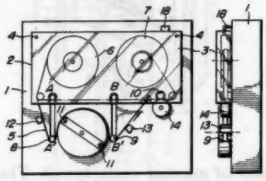


A monitor for sensing and displaying a call-number transmitted from a telephone when a telephone number is dialled, comprises an electrical impulse generator for sensing electrical impulses transmitted from the telephone when a number is dialled, and transmitting an amplified train of impulses to a monostable vibrator. The monostable vibrator in turn emits a pulse to a digit counter having a plurality of spaces. A logic circuit is provided including a plurality of gate means each having first inputs electrically connected to the output of the electrical impulse generator and second inputs each connected respectively to an output of a different stage of the digit counter. A plurality of totalizing counters are each electrically connected to the output of a gate means for totalizing the inputs transmitted from the gate means and the output of each totalizing counter is connected to display means.

3,674,942
MAGNETIC RECORDING AND REPRODUCING APPARATUS OF CASSETTE TYPE

Hiroshi Sugaya, Suita, and Takuya Nasu, Hirakata, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 673,166, Oct. 5, 1967, abandoned. This application Nov. 24, 1970, Ser. No. 92,544
Claims priority, application Japan, Oct. 17, 1966, 41/68833
Int. Cl. G11b *23/08*
U.S. Cl. 179—100.2 Z 8 Claims

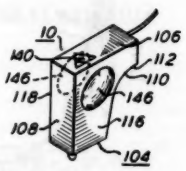


A magnetic recording and reproducing apparatus of the cassette type having a tape drive system in which a tape supply reel and a take-up reel are accommodated in a juxtaposed or unitarily stacked relation in a detachable tape cassette and movable tape guide rollers or pins are provided so that a magnetic tape can substantially straightly run in the quick feed and quick rewinding operation without being interfered by a rotary video head and other members, while the tape can be brought into engagement with the rotary video head in the recording and reproducing operation.

3,674,943
HANDHELD MAGNETIC TRANSDUCER WITH TIP MEMBERS HAVING A HEMISPHERICAL READING PORTION

William G. Benson, West Orange, N.J., assignor to Litton Business Systems, Inc., New York, N.Y.

Filed Sept. 4, 1969, Ser. No. 855,122
Int. Cl. G11b *5/22*
U.S. Cl. 179—100.2 C 2 Claims

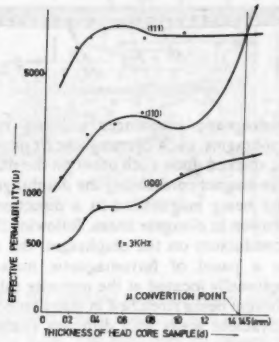


A handheld magnetic transducer comprises a gun-shaped housing having a directional arrow on one surface. The arrow is illuminated by a light within the housing indicating the operating state of the transducer as determined by a signal device. The housing has dimples in opposed side walls for ease of grasping. The armature is in two parts. Each part has a T-shaped portion the crossbars of which overlap. The armature is inserted within the bobbin and is resiliently held at the crossbars to lock into position with a shim. The bobbin front wall in combination with the armature and shim form the muzzle or reading end of the transducer and has a substantially frustro pyramidal shape. The armature-bobbin structure is held in place by fingers which form a part of the transducer housing. The wires from the coil are secured to clips. The clips or terminal are U-shaped members spring retained on arms of the bobbin. The clips each have a flange portion for engaging an aperture in the arm. The reading portion of the transducer is hemispherical in shape with the gap defining an arc thereon such that the transducer is capable of rotation or positioning about one of three axes while moving relative to a record.

3,674,944
MAGNETIC TRANSDUCER HEADS

Toshio Iemura; Masaru Doi, and Yoshiaki Shimizu, all of Moriguchi, Japan, assignors to Sanyo Electric Co., Ltd.

Filed June 12, 1970, Ser. No. 45,670
Claims priority, application Japan, June 12, 1969, 44/46382
Int. Cl. G11b *5/14*
U.S. Cl. 179—100.2 C 6 Claims

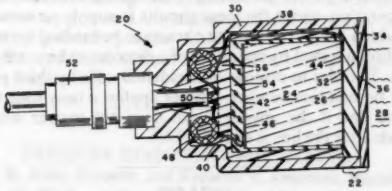


A magnetic transducer head comprises a pair of single crystal ferrite core members each having a magnetic path forming surface of a 111 plane, or substantially a 111 plane, such that if inclined thereto no property of a 111 plane is lost. The ferrite block is decreased in thickness by working under a frequency parameter *f* comprising the operating upper limit frequency of the head core, the thickness of the head core affording a μ conversion point defined by the thickness v. effective permeability characteristic curve of the head core which is not smaller than the width of the track on the record medium engaged by the head.

3,674,945
ACOUSTIC IMPEDANCE MATCHING SYSTEM

Edward Hands, San Carlos, Calif., assignor to Raytheon Company, Lexington, Mass.

Filed March 11, 1970, Ser. No. 18,582
Int. Cl. H04r *1/28, 17/00*
U.S. Cl. 179—110 A 12 Claims

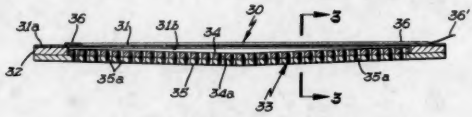


A transducer assembly incorporating a stratified medium for conducting acoustic waves from an acoustic source of relatively high impedance, such as a piezoelectric crystal, to a gaseous environment of relatively low impedance, the stratified medium including typically at least one layer of a foam structured low density plastic material, whereby uniform variations in impedance are provided progressively from the source through the layers of the stratified medium into the gaseous environment to effect an impedance match.

3,674,946
ELECTROMAGNETIC TRANSDUCER

James M. Winey, White Bear Lake, Minn., assignor to Magnepan Incorporated, White Bear Lake, Minn.

Filed Dec. 23, 1970, Ser. No. 100,856
Int. Cl. H04r 9/00
U.S. Cl. 179—115.5 42 Claims

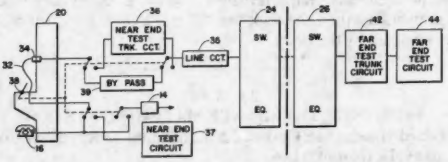


An electromagnetic transducer utilizing one or more vibratable diaphragms, each carrying one or more conductors which may be stacked upon each other on the diaphragm, and a flexible sheet magnet confronting the diaphragm and spaced therefrom and being magnetized in a direction through its thinnest dimension in elongate zones, following the configuration of the conductors on the diaphragm, the sheet magnet lying against a panel of ferromagnetic material; another diaphragm optionally located at the opposite side of the magnet, the diaphragm being stretched in many embodiments, and numerous vibratable areas with different resonant frequencies.

3,674,947
REMOTE TESTING SYSTEM FOR COMMUNICATION CIRCUITS

William Chulak, Chambly, Quebec, Canada, assignor to Northern Electric Company, Limited, Quebec, Canada

Filed May 3, 1971, Ser. No. 139,724
Int. Cl. H04m 3/22
U.S. Cl. 179—175.2 R 5 Claims



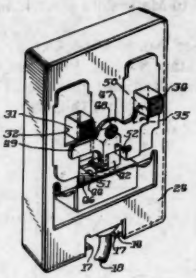
A connection to a test trunk circuit and associated test circuit at an outlying central office is dialed from a test center, eliciting a short reply tone pulse as a signal to restore local circuits manually from the dialing to the testing connection. This last operation causes the local circuits to supply an answering tone which causes the remote circuits to be readied for testing until disconnected by operation of a disconnect key at the test center. In order to dispose of accidental calls by third parties to the far end test number, a timer applies a busy tone to the far end line if the answer signal does not appear within 6 seconds after the line is seized.

3,674,948
CONTROL MECHANISM HAVING CYCLE SWITCHES SELECTIVELY ACTUATING A MODE SWITCH

Frank W. Betlejewski, Chicago, and Sanford M. Hanberg, Morton Grove, both of Ill., assignors to Bell & Howell Company, Chicago, Ill.

Filed Feb. 2, 1971, Ser. No. 111,891
Int. Cl. H01h 9/20
U.S. Cl. 200—50 C 5 Claims

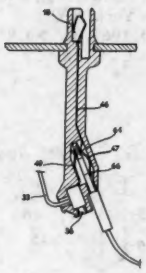
A control mechanism is provided for selecting among predetermined operational modes of an instrument upon actuation of selected of a plurality of manually operable cycle switches. The cycle switches are coupled mechanically with a mode switch which is adjustable to be actuated to one of the operative modes upon first actuation of a cycle switch following an actuation of another cycle switch. The last actuated cycle switch may be cycled repeatedly without changing the mode switch.



3,674,949
CONNECTING DEVICE FOR AN ELECTRONIC APPARATUS CARRYING PANEL

Claude P. H. Leymarie, Grenoble, France, assignor to MERLIN GERIN, Societe Anonyme of Rue Henri Tarze, Grenoble, France

Filed Aug. 3, 1971, Ser. No. 168,692
Claims priority, application France, Aug. 10, 1970, 7029464
Int. Cl. H01r 33/30
U.S. Cl. 200—51.1 8 Claims



A connecting device for connecting a plurality of input and output conductors directly to an electronic apparatus carrying panel, such as a printed circuit-panel. A binding post having plug-in contacts receives the border of the panel and has screw-operated contacts for clamping the end of the conductors. The plug-in contacts and the screw contacts are connected by a strips having a bridge contact which can be opened by an insulating jack.

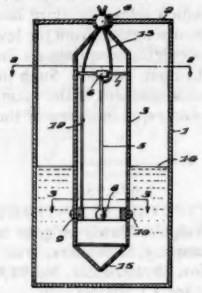
3,674,950
SELF-ALIGNING MOTION DETECTORS

Andrew E. Scoville, Ellington, Conn., assignor to American Multi-Lert Corporation, Hershey, Pa.

Filed Oct. 21, 1970, Ser. No. 82,570
Int. Cl. H01h 35/14
U.S. Cl. 200—61.48 12 Claims

A motion detector for energizing an alarm signal at a suitable location and which is responsive to linear motion of an object on which the detector may be mounted and capable of self-alignment to the object. The detector comprises a case or

suitable enclosure within which an outer pendulum or pendulum body is supported for freedom of universal but sluggish movement and within which a second pendulum or body is supported for universal and unconstrained movement with respect to the outer pendulum. Contact is made between respective pendulums or bodies upon motion of the case to transmit an electrical signal to a suitable sensor, alarm or the



like. The motion of the outer pendulum is suitably constrained as by immersing it in a liquid within the case or by providing it with a greater period than the inner pendulum or body in compound pendulum aspects. A contact ring may be located on the inner wall of the outer pendulum or other suitable contact means for electrical contact between the ring and the inner pendulum or between the contact means to close a control circuit.

3,674,951

TRIGGER SWITCH FOR MOTOR VEHICLE SAFETY DEVICES

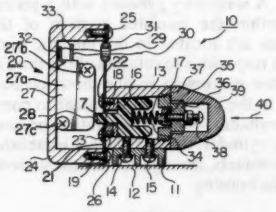
Takashi Haruna, Yokosuka, and Kazutaka Taniguchi, Tokyo, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Feb. 19, 1971, Ser. No. 116,961

Claims priority, application Japan, March 18, 1970, 45/26022

Int. Cl. H01h *35/14*

U.S. Cl. 200—61.53 **1 Claim**



A trigger switch mechanism for actuating motor vehicle safety devices responsively to deceleration of a given magnitude resulting from a collision of the motor vehicle. The mechanism comprises a cylinder mounted on the vehicle body in a horizontal manner with a cylindrical weight mounted within the cylinder chamber for axial movement so that when the trigger switch mechanism is subjected to deceleration of a given magnitude in the one direction, a force of inertia forces the cylindrical weight to move axially in the opposite direction, allowing an actuator pin to extend so that a microswitch is closed.

3,674,952

LOCKSWITCH

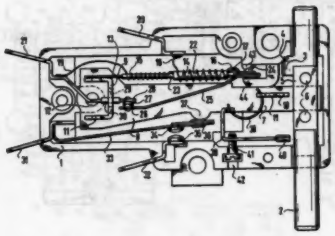
Jakob Ellenberger, Altdorf near Nuernberg, Germany, assignor to Ellenberger & Poensgen GmbH, Altdorf near Nuernberg, Germany

Filed Oct. 26, 1970, Ser. No. 83,893

Claims priority, application Germany, Oct. 27, 1969, P 19 53 983.4

Int. Cl. H01h *27/06, 61/013, 7/00*

U.S. Cl. 200—61.64 **9 Claims**



A lock switch for washing machine doors and the like having a locking plunger which is moved by a lever which is acted on by a bimetal strip. The strip may be caused to bend by a heating coil, and the bending movement is transmitted to the plunger by the lever.

3,674,953

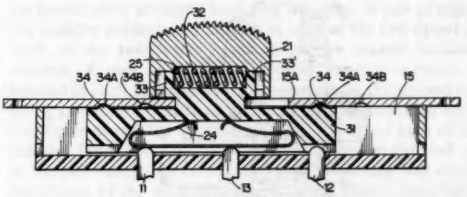
SLIDE SWITCH WITH SNAP ACTION

Arnold A. Brevick, Hollywood, Fla., assignor to UID Electronics Corp., Hollywood, Fla.

Filed Sept. 21, 1970, Ser. No. 73,706

Int. Cl. H01h *15/18*

U.S. Cl. 200—77 **8 Claims**



A snap action sliding contact switch interconnects at least two stationary contacts. Actuation temporarily stores energy in a spring generally parallel to the path of sliding movement that is then released against the movable contact support to provide snap action.

3,674,954

PRESSURE RESPONSIVE MECHANISM

George R. Kish, Owosso, and Kenneth B. Swanson, Bannister, both of Mich., assignors to Midland-Ross Corporation, Cleveland, Ohio

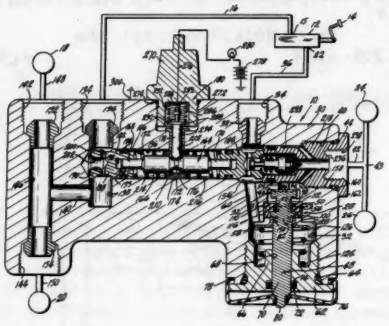
Filed June 19, 1970, Ser. No. 47,718

Int. Cl. B60t *17/22*

U.S. Cl. 200—82 D **7 Claims**

A pressure responsive mechanism for use in dual hydraulic brake systems of automotive vehicles wherein the front and rear brakes of the vehicle are provided with independent hydraulic brake systems actuated by a dual master cylinder, the pressure responsive mechanism being interposed between the dual master cylinder and the front and rear brake actuators and incorporating means actuable when a predetermined

pressure differential occurs between the front and rear brake systems to effect a signal and being automatically reset when the pressure differential falls below a predetermined value. The pressure responsive mechanism also incorporates brake proportioning means and in the event of loss of pressure in the



front brake system while pressurization of the rear brake system relative to the front brake system has been reduced by the brake proportioning means, means is also provided for disabling the brake proportioning means and restoring full pressurization of the rear brake system.

3,674,955

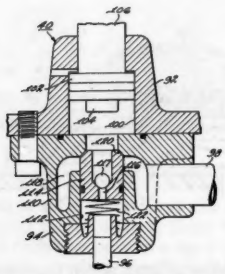
CIRCUIT BREAKER WITH HYDRAULIC OPERATING MECHANISM FOR VACUUM INTERRUPTER

Henry L. Peek, Wellesley, Mass., assignor to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

Filed Dec. 17, 1970, Ser. No. 98,972

Int. Cl. H01h *35/38*

U.S. Cl. 200—82 B **9 Claims**



A vacuum circuit breaker comprises three vacuum circuit interrupters, each having a pair of separable contacts therein, which are opened and closed by an operating mechanism. The operating mechanism comprises a separate operating rod connected to the movable contact of each interrupter and each operating rod has an opening acceleration spring connected thereto. All operating rods are driven to contact closed position by a main piston which is disposed in a hydraulic cylinder. Hydraulic fluid is supplied to the cylinder under great pressure by a high-speed gear pump, which is driven by a DC series-wound high speed electric motor, through a small orifice (containing a one-way check valve) located in a valve piston in the cylinder. The valve piston, which is spring-loaded, effects closure of a relatively large dump port leading from the cylinder. The valve piston is moved to open the dump port when the main piston is mechanically moved against the fluid in the cylinder by all operating rods as they are driven to contact open position by their accelerating springs.

Closing of the circuit breaker is accomplished by energizing a closing solenoid which releases a first latch which allows a spring loaded motor control switch to close momentarily. Closure of the motor control switch starts the pump motor and the pump supplies hydraulic fluid to drive the main piston (and all operating rods) to contact closed position. Such movement allows a second latch to reset and engage a lever connected to the main piston to lock the latter (and the operating rods and contacts) in closed position. Resetting of the second latch also opens the motor control switch to stop the pump motor.

Opening of the circuit breaker is accomplished by energizing a trip solenoid which releases a third latch which allows the second latch to be disengaged from the lever under the action of the opening acceleration springs on the operating rods as the latter move to open position. Such movement of the operating rods causes movement of the main piston, opening of the valve piston, and rapid dumping of the hydraulic fluid from the cylinder.

3,674,956

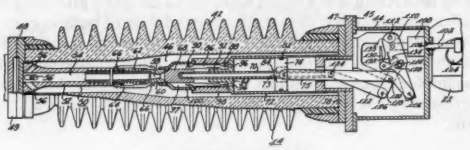
PUFFER TYPE CIRCUIT INTERRUPTER

Heinrich H. Erni, Walpole, Mass., assignor to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

Filed Nov. 19, 1970, Ser. No. 91,057

Int. Cl. H01h *33/70*

U.S. Cl. 200—148 A **21 Claims**



Electrical circuit interrupting apparatus comprises a support at ground potential having three spaced apart upstanding rotatable insulators thereon. Disconnect switch means are supported between a first end column and a second center column and rotation of both of these columns effects operation of the disconnect switch. A puffer type circuit interrupter is connected in series with the disconnect switch and is supported between the second center column and a third end column and rotation of the latter column effects operation of the interrupter.

The interrupter comprises a sealed housing comprising a hollow insulator and a hollow metallic portion containing an arc extinguishing gas and a hollow stationary contact and a solid movable contact are located within the insulated portion of the housing. A stationary cylinder with a piston therein is also located within the insulated portion of the housing. Operating means are located in the metallic portion of the housing and are responsive to rotation of the third end column and effects piston movement in one direction and compression of the gas in the cylinder. Subsequent to compression of the gas in the cylinder, contact separation occurs and gas is forced from the cylinder, through the arc established between the separating contacts, through the hollow stationary contact and back into the housing.

3,674,957

GAS BLAST SWITCH

Gerhard Korner, Schriesheim; Wolfgang Schmitz, Birkenau; Friedhelm Dabringhausen, Mannheim-Wallstadt, and Lothar Gruber, Dortmund, all of Germany, assignors to Brown, Boveri & Cie AG, Mannheim, Germany

Filed May 19, 1971, Ser. No. 144,765

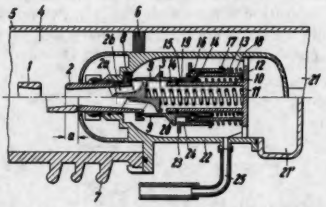
Claims priority, application Germany, May 22, 1970, P 20 24 988.1

Int. Cl. H01h *33/86*

U.S. Cl. 200—148 BV **11 Claims**

In the gas blast switch disclosed, a first contact member in a gas pressure chamber moves from an open position out of con-

tact with a counter-contact member toward the forward position of the counter-contact member until it hits the latter and drives it backwards against the force of a spring. The counter-contact member forms a gas seal with a valve sleeve that the counter-contact member pushes back against the force of a second spring. A spring actuated retaining mechanism holds the sleeve in the back position. When the first contact member



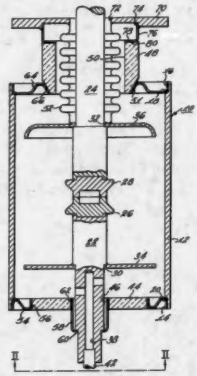
is moved into the open position the sleeve is held and the first spring moves the counter-contact member away from the sleeve to open the seal. This releases a flow of gas from the chamber past the contact member. The gas flow strikes a vane in the retaining mechanism. The response of the vane is to release the sleeve. The second spring drives the thus released sleeve into engagement with the counter-contact member to cut off gas flow.

3,674,958

VACUUM CIRCUIT INTERRUPTER

Edward A. Attia, Milwaukee, and Rolf Dethlefsen, New Berlin, both of Wis., assignors to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

Filed Nov. 23, 1970, Ser. No. 92,032
Int. Cl. H01h *33/66*
U.S. Cl. 200—144 B **4 Claims**



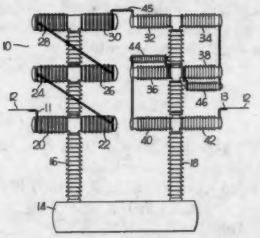
An improved vacuum type circuit interrupter rated at 50 mva and for use at a voltage level of 4.8 KV and above comprises a constant diameter hollow cylindrical copper envelope into which a stationary and movable OFHC copper contact rods extend. Each contact rod is provided at its tip with a copper-bismuth alloy contact. A pump-out port is provided through the stationary contact rod. In one embodiment, one end of the envelope is provided with a substantially flat ceramic end plate which has a central opening for accommodating the stationary contact rod. A thin Kovar sealing ring is disposed between the envelope and the outer periphery of the ceramic end plate and a thin Kovar sleeve is disposed between the end plate and the stationary contacr rod. The other end of the envelope is provided with a hollow cylindrically shaped ceramic end tube. A thin Kovar ring is disposed between the envelope and the outer periphery of the ceramic end tube. A copper mounting plate having a central opening is secured to the outer end of the ceramic end tube and a cylindrical bellows surrounds the movable contact rod and is secured between the mounting plate and the movable contact rod. Disk-like shields made of copper or nickel are disposed against shoulders on the two contact rods to confine arc products. In a second embodiment of the invention, a ceramic tube is used instead of the flat ceramic end plate.

3,674,959

CIRCUIT INTERRUPTER CLOSING RESISTORS

Thomas F. Clark, Canton, Mass., assignor to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

Filed Dec. 10, 1970, Ser. No. 96,887
Int. Cl. H01h *33/16, 33/14*
U.S. Cl. 200—144 AP **5 Claims**



A fluid blast type electric circuit interrupter comprises a tank at ground potential containing compressed fluid (air). First and second hollow insulating columns are mounted on said tank in spaced apart relationship. The first insulating column supports six transversely arranged insulating housings and a pair of separable circuit interrupter contacts are located in each housing. The second insulating column also supports six transversely arranged insulating housings. A pair of separable isolator contacts are located in each of the two upper and each of the two lower housings on the second insulating column. A pair of separable resistor control contacts are located in each of the two middle housings on the second insulating column. All pairs of contacts are connected in series. Each pair of resistor control contacts is shunted by a closing resistor. Fluid flow control valves are located in the tank and in the two insulating columns to effect opening and closing operations of the pair of contacts of the circuit interrupter. The control valves effect an opening operation by first opening the circuit interrupter contacts, subsequently opening the isolator contacts and the resistor control contacts simultaneously, and subsequently reclosing the circuit interrupter contacts. The control valves effect a closing operation by first closing the isolator contacts and subsequently closing the resistor control contacts.

3,674,960

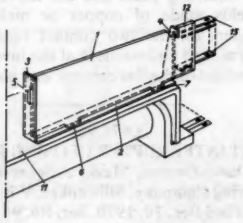
MEANS FOR ATTACHING A PRINTED CIRCUIT CARD ON A RELAY

Tore Samuel Krantz, Stockholm, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed Dec. 17, 1970, Ser. No. 98,981
Claims priority, application Sweden, Jan. 9, 1970, 254/70
Int. Cl. H01h *9/02*
U.S. Cl. 200—168 C **3 Claims**

A substantially rectangular printed circuit board is secured to the yoke of a relay by means of a generally U-shaped holder the web of which is detachably mounted on the yoke. The circuit board is placed with its short edges between the branches of the holder parallel thereto. One short edge and one long edge of the board is retained on one branch and the web

respectively of the holder by lugs extending into corresponding slots in said branch and the web. The other branch of the holder is formed with a hook overlying the other long edge of the board pressing the same against the web. The board occupies the space on the yoke normally occupied by the contact spring assembly of the relay and has at its edge held by the hook soldering tags aligned with the general plane of the board. These tags are shaped and located similar to the soldering tags of a contact spring assembly.

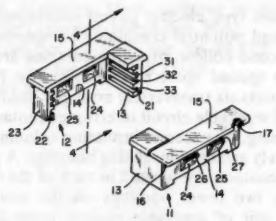


3,674,961

INSERTABLE HOUSING

Thomas H. Wright, Jr., Boca Raton, Fla., assignor to ULD Electronics Corp., Hollywood, Fla.

Filed April 2, 1971, Ser. No. 130,652
Int. Cl. H01h *9/08, 9/02*
U.S. Cl. 200—168 C **9 Claims**



Two like L-shaped elements mate together to form an insertable switch housing having a number of spaced grooves in opposed end walls for accommodating different types of switches and have opposed pairs of cantilevered L-shaped legs serrated at the top that may be urged inward as the housing is inserted through an opening in a chassis and then snap out to coact with an outside lip of the hosing and sandwich a portion of the chassis plate adjacent the edge of the slot through which the switch is inserted. A feature of the invention is that a number of switches may be inserted side by side in a common slot with a generally Z-shaped adapter between switches arranged to coact with respective generally L-shaped members so that two of the L-shaped members and one less than the total number of side-by-side switches to be accommodated form the housing.

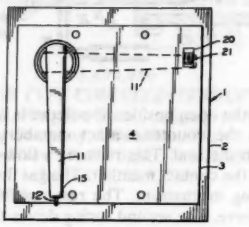
3,674,962

MEANS FOR A RETAINING A CIRCUIT BREAKER HANDLE IN ON POSITION WHILE THE CIRCUIT BREAKER CONTACT ARMS ARE LATCHED IN OFF POSITION

Jerry E. Kroeger, Mount Vernon, Iowa, assignor to Square D Company, Park Ridge, Ill.

Filed July 12, 1971, Ser. No. 161,824
Int. Cl. H01h *3/06*
U.S. Cl. 200—172 A **4 Claims**

The circuit breaker has an enclosure with a cover. An exterior operating handle is pivotally mounted on the cover for swinging in a path alongside the outer face of the cover to and from ON and OFF positions, selectively. A latching detent carried by the handle is movable relative thereto toward and away from the cover and is biased away from the cover by a spring. The cover carries an abutment positioned in said path. When the handle is swung along the path while the detent is in the retracted position, the detent can pass the abutment. The abutment is close to the ON position of the handle and can engage the detent when the handle is moved slightly from ON toward OFF position while the detent is in extended position. The force of the biasing spring is such that frictional resistance of the engaged surfaces of the detent and abutment can overcome the biasing force of the detent spring and thereby hold the detent member in extended position and thereby the handle in ON position, so long as a predetermined minimum applied force is applied to the handle in a direction to bias the handle in the OFF direction. The spring can retract the detent when the applied force becomes less than said predetermined minimum. The applied force is applied by toggle springs of the operating mechanism of the circuit breaker which springs have been preconditioned, by the movement of the handle to ON position, while the circuit breaker contact arms are latched in OFF position, for moving the contact arms of the circuit breaker to ON position when the arms are released.

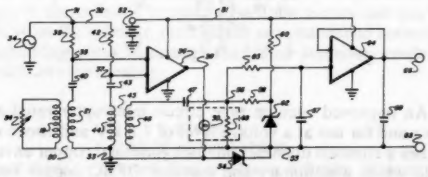


3,674,963

MEASUREMENT APPARATUS HAVING NON-CONTACT ELECTRICAL COUPLING TO COMPONENTS ON A MOVING SURFACE

Leonardo V. Serrano, Minneapolis, Minn., assignor to Rosemount Inc., Eden Prairie, Minn.

Filed Oct. 19, 1970, Ser. No. 81,852
Int. Cl. H05b *5/00*
U.S. Cl. 219—10.61 **12 Claims**



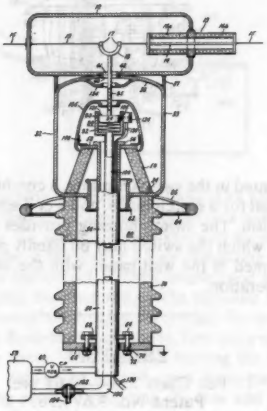
A system for measuring temperature sensed by a resistance thermometer attached to a moving structure. Impedance of the resistance thermometer is coupled into an AC bridge and a variable resistor is also coupled into the bridge to balance the bridge when the thermometer changes in impedance due to temperature change. The resistance of the variable resistor is sensed by DC circuitry and a resultant DC signal proportional to temperature is thus provided.

3,674,964

HIGH VOLTAGE ELECTRIC CIRCUIT BREAKER WITH RAPID RESPONSE TRIPPING MEANS

Philip Barkan, Media, Pa., assignor to General Electric Company

Filed May 20, 1971, Ser. No. 145,415
Int. Cl. H01h 33/54
U.S. Cl. 200—148 R 18 Claims



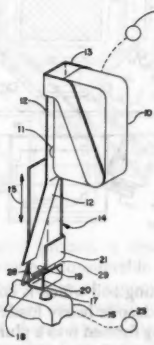
A high voltage electric circuit breaker comprising a high potential tank mounted atop an insulating column. Opening of the circuit breaker is initiated by an operator located atop the insulating column in a housing filled with high dielectric strength fluid. The operator is maintained at ground potential by electroconductive structure extending vertically through the column between the operator and the base of the column. The operator is connected to control means within the high potential tank by a short operating rod of insulating material that extends through said dielectric fluid.

3,674,965

SWITCH PROGRAMMING DEVICE WITH SEQUENTIALLY ACTUATED SWITCHES

Donald E. Moodie, Nashua, N.H., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Oct. 5, 1970, Ser. No. 78,103
Int. Cl. H01h 9/26
U.S. Cl. 200—153 R 20 Claims



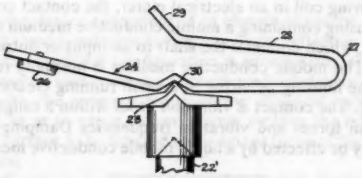
A mechanical system for operating functions for example, electrical switches on a programmed basis. An actuator movable past a follower in reciprocatory movement with the follower on one path in one direction and on another path in the reverse direction. One way mechanical gate to require change in travel path on reverse of reciprocation to preclude reversal of sequence regardless of reversal of movement. Ramp and platform to actuate and hold switch on programmed basis. Application example, sequential operation of electronic flash units in a photographic system.

3,674,966

TILT SWITCH WITH ELONGATED SWITCH BLADE MOUNTED ON A TRIANGULAR PIVOT FOR WIPING ACTION

Eric L. Long, Highland Park, Ill., assignor to Cherry Electrical Products Corporation, Highland Park, Ill.

Continuation-in-part of Ser. No. 724,809, April 29, 1968, Pat. No. 3,562,462. This application June 22, 1970, Ser. No. 48,197
Int. Cl. H01h 1/18, 23/30
U.S. Cl. 200—164 4 Claims



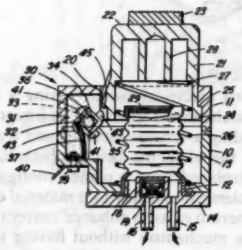
A switch having a tiltable actuator for pivoting a switch blade about a pivot terminal post in a make-and-break movement with respect to a pair of associated terminal contacts, and for effecting continuing wiping movement of the blade transversely across the face of the terminal contact.

3,674,967

WINDSCREEN WASHING DEVICES

Brian Allison Walker, Stoke, England, assignor to Chrysler United Kingdom Limited, London, England

Filed Sept. 14, 1970, Ser. No. 71,644
Claims priority, application Great Britain, Sept. 19, 1969, 46,341/69
Int. Cl. H01h 17/08
U.S. Cl. 200—156 2 Claims



A windscreen washing device comprises a washing fluid pump having an operating member which also opens and closes an electrical switch for a windscreen wiper motor by successive movements of the member from a first to a second position. Detent means are provided for holding the switch in the closed and open positions and the switch can be closed by movement of the operating member to an intermediate position without releasing the detent means so that when the operating member is returned to the first position the detent means re-open the switch.

3,674,968

ELECTRICAL CONTACT ASSEMBLY HAVING DAMPING MEANS

Thomas Edward Langdon, 10 Park Crescent, Elstree, England

Filed July 20, 1970, Ser. No. 56,287

Claims priority, application Great Britain, July 25, 1969, 37,613/69

Int. Cl. H01h *1/50*

U.S. Cl. 200—166 H **12 Claims**

An electrical contact for a conductive shaft such as a shaft for a moving coil in an electrical meter, the contact comprising a housing containing a mobile conductive medium such as mercury, which connects the shaft to an input or output conductor. The mobile conductive medium is normally retained within the housing by virtue of a small running clearance for the shaft. The contact is vibration proof within a range of acceleration forces and vibration frequencies Damping of the shaft may be effected by a liquid mobile conductive medium.

3,674,969

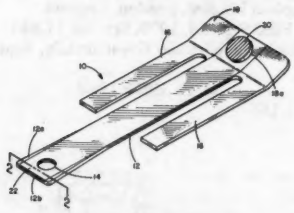
STAINLESS STEEL SNAP ACTING MECHANISM WITH LOW RESISTANCE ELECTRICAL PATH

Gordon A. Engle, Freeport, Ill., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Aug. 4, 1971, Ser. No. 168,915

Int. Cl. H01h *1/02*

U.S. Cl. 200—166 C **5 Claims**



A snap acting electrical switch having a current carrying snap acting mechanism formed of an integral stainless steel member including a tension element and a compression element, one of the elements being substantially flat and the other being displaced from a planer configuration. The substantially flat element only having a material of higher conductivity joined thereto so as to enhance current carrying characteristics of the mechanism without having adverse effect on the mechanical characteristics of the mechanism.

3,674,970

PANEL-MOUNTED SWITCH

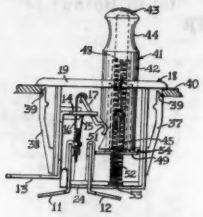
Michael F. Bedocs, Highland Park, Ill., assignor to Cherry Electrical Products Corporation, Highland Park, Ill.

Filed Oct. 23, 1970, Ser. No. 83,497

Int. Cl. H01h *3/12*

U.S. Cl. 200—168 C **4 Claims**

A switch housing adapted to be mounted in an opening formed in a wall panel having a construction comprising complementary case and cover, each providing an inner structural configuration by which various switch actuators resulting in different conventional operations of the switch components, may be accommodated. The switch components employed with the various actuators comprise spaced apart terminals



fixedly mounted in the switch housing, a combination terminal and pivot post for a switch blade, and a coil spring overcentering mechanism. The switch housing provides external yieldable arms by which the switch may be fixedly positioned in the opening formed in the wall panel, with the actuator exposed for ready operation.

ERRATUM

For Class 219—10.61 see:
Patent No. 3,674,963

3,674,971

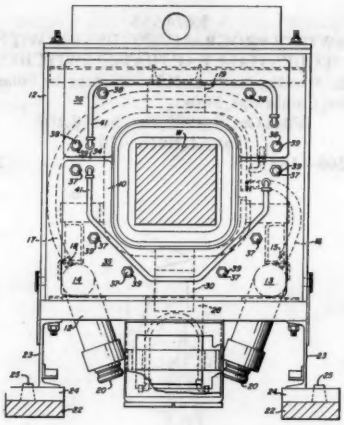
INDUCTION HEATING COIL CONSTRUCTED TO MINIMIZE VIBRATION AND NOISE

William A. Emerson, and John A. Redmond, both of Ellicott City, Md., assignors to United States Steel Corporation

Filed May 13, 1971, Ser. No. 142,870

Int. Cl. H05b *9/02*

U.S. Cl. 219—10.79 **6 Claims**



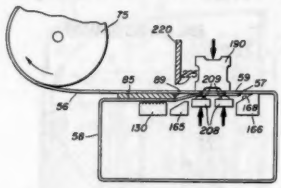
An induction heating coil which is constructed to minimize vibration and noise despite heavy loads and high voltage. The coil includes a tubing formed into a plurality of turns mounted in a frame. The tubing defines a tunnel through which a workpiece travels continuously in the direction of its length. Sectional water-cooled metal plates are placed over the ends of the tunnel and connected with tie bolts. The bolts carry Belleville washers or springs which are tightened to flatness.

3,674,972

WELDED JOINT STRAPPING MACHINE

Edward J. Stahnke, Riverdale, Ill., assignor to Interlake, Inc., Chicago, Ill.

Filed Oct. 27, 1970, Ser. No. 84,377
Int. Cl. B23k 1/00
U.S. Cl. 219—56 30 Claims



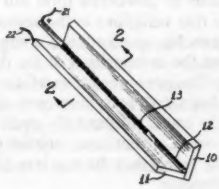
A strapping machine comprises gripping jaws for holding a strap encircled about an object with a free end portion of the strap overlapping the supply portion thereof, means for tensioning the loop about the object, a pair of welding electrodes disposed between the object and the overlapped portions of the strap, a shorting bar disposed on the opposite side of the overlapped portions of the strap, a shear blade for severing the welded strap loop from the strap supply, first drive mechanism for operating the shear blade and for moving the electrodes and shorting bar between a spaced-apart strap-passing position and a welding position clamping the free end portion of the strap against the overlapping tensioned portion, second drive mechanism for opening and closing the gripping jaws and for moving the electrodes laterally between the strap-passing position and a strap-releasing position disposed from between the strap and the object, and control apparatus actuating the drive mechanisms to sequentially tension the loop, weld the joint, relieve the strap tension, sever the strap, open the gripping jaws and move the electrodes to the releasing position.

3,674,973

LAYDOWN ELECTROSLAG WELDING PROCESS

Brian Anthony Graville, Ville La Salle, Quebec, Canada, assignor to Dominion Bridge Company Limited, Montreal, Quebec, Canada

Filed May 6, 1971, Ser. No. 140,731
Claims priority, application Canada, March 22, 1971, 108,393
Int. Cl. B23k 9/18
U.S. Cl. 219—73 5 Claims



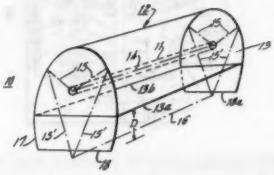
An electroslag welding process is described for welding metal workpieces, in which a consumable electrode is melted by contact with a molten slag pool supported in contact with surfaces of the workpieces onto which the metal from the electrodes is deposited. According to the novel feature, the workpiece surfaces together form a horizontally extending groove and the consumable electrode is placed horizontally within the groove surrounded by flux and at a distance from the workpieces greater than that at which arcing to the workpieces occurs during welding, whereby the electrode is progressively melted by the molten slag pool along the length of the groove with the molten electrode metal collecting at the bottom of the slag pool to form a weld joining the workpieces.

3,674,974

HEATING & FUSING DEVICE

Bernard J. Costello, Ringoes, N.J., assignor to Argus Engineering Company, Inc., Hopewell, N.J.

Filed Oct. 9, 1970, Ser. No. 79,515
Int. Cl. B23k 1/02
U.S. Cl. 219—85 8 Claims



A heating device comprised of an elongated source of radiant energy and a reflector having a concave reflective surface whose cross-sectional configuration is substantially elliptical. The elongated energy source is positioned substantially coincident with the primary focus of the elliptical cylindrical reflector so as to cause radiant energy striking the reflective concave surface to be focused at the image focus of the elliptical surface.

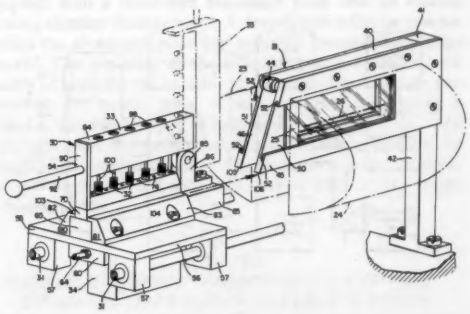
The reflector is a cylindrical member having planar highly reflective end portions which act to compensate for end losses and provide substantially uniform intensity of radiation along the entire line image.

3,674,975

APPARATUS FOR ASSEMBLING STACKS

Reginald F. Nugent, Yardley, Pa., and George P. Snyder, Trenton, N.J., assignors to Time Research Laboratories, Inc., Pennington, N.J.

Filed Nov. 6, 1969, Ser. No. 874,505
Int. Cl. B23k 1/02
U.S. Cl. 219—85 9 Claims

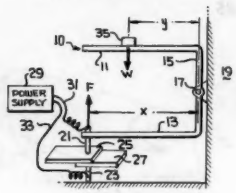


Equipment for assembling stacks including an infra-red source, a fixed socket, a reciprocating shuttle on which groups of stacks can be loaded in upright position, the shuttle is movable into the socket to form a dry box with the stacks inside, the stacks are then subject to receive infra-red energy through window means in the socket section and mechanical energy through a transducer mounted on the shuttle. After exposure the shuttle is moved away from the socket so that the stacks can be unloaded and replaced by a new group.

3,674,976
WELDING HEAD FOR PRODUCING UNIFORM AND REPEATABLE RESISTANCE WELDS

Sheldon S. Bitko, Cherry Hill, N.J., assignor to Fifth Dimension Inc., Princeton, N.J.

Filed Nov. 13, 1970, Ser. No. 89,391
Int. Cl. B23k 9/28
U.S. Cl. 219—86 5 Claims

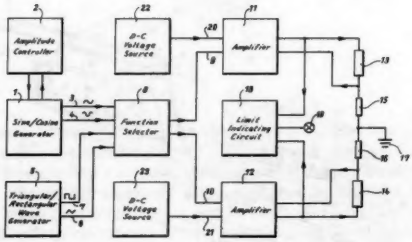


In a welding head, the weight of a substantially free-falling body is applied to a welding electrode via a lever, the mechanical advantage introduced by the lever being selected to achieve a predetermined movement of said electrode into a body to be welded during a predetermined time interval, irrespective of the magnitude of the weight, the weight being selected to apply a predetermined weld pressure at the electrode via the mechanical advantage of the lever. Timing operation depends solely on a falling weight and hence is perfectly reproducible for a variety of weld pressures.

3,674,977
ELECTRON BEAM DEFLECTION APPARATUS

Rolf Mayer, and Johann Reitinger, both of Stuttgart, Germany, assignors to Universitat Stuttgart, as represented by the Institut fur Kernenergetik, Stuttgart, Germany

Filed Dec. 11, 1970, Ser. No. 97,095
Claims priority, application Germany, Dec. 18, 1969, P 19 63 454.9
Int. Cl. B23k 15/00
U.S. Cl. 219—121 EB 7 Claims

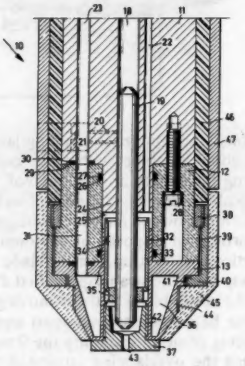


Apparatus for deflecting the beam of an electron beam welding device, or similar source of a beam of radiant energy. The apparatus comprises a sine/cosine wave generator and a triangular/rectangular wave generator selectively connectable to the inputs of a bi-channel amplifier whose output is connected, for example, to the deflection coils, or plates, of the electron beam device. Circuitry is provided to obtain either a frequency or amplitude modulation of the deflection currents or voltages supplied to the deflection coils or plates of the device.

3,674,978
TORCH, ESPECIALLY FOR PLASMA CUTTING

Werner Becker, Frankfurt am Main; Alfward Farwer, Kelkheim; Georg Frank, Langen; Bernhard Reis, Frankfurt am Main; Josef Rohf, Frankfurt am Main, and Rupert Auer, Frankfurt am Main, all of Germany, assignors to Messer Griesheim GmbH, Frankfurt/Main, Germany

Filed April 23, 1971, Ser. No. 136,883
Claims priority, application Germany, April 24, 1970, P 20 19 946.6
Int. Cl. B23k 9/00
U.S. Cl. 219—121 P 6 Claims



Disclosed is a plasma cutting torch comprising an electrode holder, an intermediate insulating piece and a nozzle holder with a nozzle inset. The parts are coaxially arranged and connected by axial fastening means. The insulating piece has a central passage into which centering plugs of the electrode holder and of the nozzle holder are inserted. A central through bore in the electrode holder holds an electrode extending through a ceramic cartridge into the interior of the nozzle inlet.

3,674,979
METHOD OF ARC WELDING

Arthur T. Cape, Monterey, Calif., assignor to Coast Metals, Inc., Little Ferry, N.J.

Filed Sept. 23, 1970, Ser. No. 74,930
Int. Cl. B23k 9/00
U.S. Cl. 219—137 4 Claims

A method of arc welding is disclosed in which a consumable electrode of predetermined composition and the same composition in granular or powdered form are fed separately to the weld area, so that variations in the amount of consumable electrode and granular or powdered composition are of no consequence, and the composition of the deposit will always remain constant. The necessity for careful control of the ratio of feed is thus eliminated, and, moreover, the pool of molten material under the arc is substantially cooler than that of the pool in other or conventional submerged arc welding methods, with the result that there is less dilution of the pool by the base or substrate.

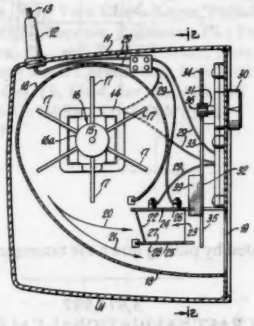
3,674,980
DIVIDED FLOW HAIRDRYER

Ernest Francis Cox, Ponteland, Newcastle, England, assignor to Ronson Corporation, Woodbridge, N.J.

Filed May 9, 1968, Ser. No. 727,806
Claims priority, application Great Britain, May 9, 1967, 21,585/67
Int. Cl. H05b 3/00; F24h 3/04; A45d 20/08
U.S. Cl. 219—367 10 Claims

A hairdrying device having an electrically driven fan mounted therein for blowing ambient air, two distinct internal

air flow paths which terminate at a common output orifice, in one of which is mounted an electric resistance heating element, and an air flow regulator movably disposed common to both paths and located adjacent the common output orifice for mixing the hot and cold air streams in a ratio, according to



the user's desire, which is infinitely variable. The air flow regulator is in the form of a shutter which is larger than the output end of the air flow paths and has an open portion and a solid portion in which the open portion covers one of the paths and the solid portion covers the other in any desired ratio.

3,674,981

ELECTRICALLY HEATED STEAM-RAISING AUTOCLAVE

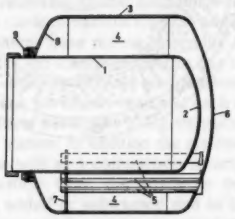
Henry M. Hattersley Pickard, Stanningley, Pudsey, England

Filed Jan. 11, 1971, Ser. No. 105,523

Claims priority, application Great Britain, Jan. 9, 1970, 1,233/70

Int. Cl. F27d *11/00*

U.S. Cl. 219—401 **5 Claims**



A steam-raising autoclave having an outer jacket, an inner pan, an enclosed space between said outer jacket and the inner pan, and electrical heating means for heating water within the enclosed space for producing steam. The outer jacket is made of larger diameter or longer than usual, or both, in order to make the space between the outer jacket and the inner pan larger than usual for containing a required amount of water.

3,674,982

ZONE CONTROLLED COOK OVEN

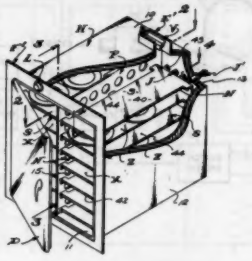
Edwin D. Hoyt, Hemet, and Luther Welsh, Riverside, both of Calif., assignors to Rama Industrial Heater Co., San Jacintom, Calif.

Filed Nov. 9, 1970, Ser. No. 87,772

Int. Cl. F27d *11/02*

U.S. Cl. 219—403 **6 Claims**

An oven for heating a plurality of individual prepared and refrigerated meals and comprising an insulated cabinet with an access door, a plurality of vertically spaced support shelves in the cabinet, the perimeters of which are spaced from adjacent walls of the cabinet, each shelf adapted to support a number of plates or trays on which the prepared meals are deposited and comprising a flat imperforate shelf-plate of



metal having a high modulus of heat conductivity, resistance heater units engaged within the shelf-plates and heat control means related to each shelf-plate and including an elongate heat sensing device within and substantially coextensive with the major dimension of the shelf-plate.

3,674,983

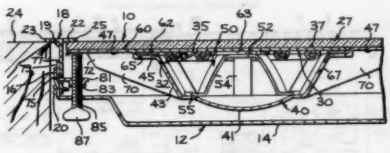
SMOOTH SURFACE ELECTRIC COOKTOP

Bohdan Hurko, and Raymond L. Dills, both of Louisville, Ky., assignors to General Electric Company

Filed April 8, 1971, Ser. No. 132,348

Int. Cl. H05b *3/68*

U.S. Cl. 219—462 **11 Claims**



A smooth surface cooktop having a large glass-ceramic plate means with individual heated areas where each area is supplied with a combined aluminum plate and an electric heating element therebeneath. A deep drawn reflector pan underlies the aluminum plate and supports the peripheral edge thereof. The top edge of the reflector pan is extended outwardly to underlie the expanse of the glass-ceramic plate surrounding the heated area. A metal compression spring is seated in the reflector pan to bear against the underside of the aluminum plate to ensure good thermal coupling between the heated aluminum plate and the glass-ceramic plate. Adjustable hold-down means secure each heating element in a rough-in mounting box.

3,674,984

VARIABLE SETPOINT PROPORTIONAL CONTROL APPARATUS FOR VACUUM BAKEOUT SYSTEMS

John C. Coats, and George W. Wilson, III., both of Garland, Tex., assignors to Republic National Bank of Dallas; Irving Trust Company and Union Bank

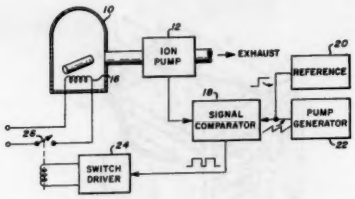
Filed May 14, 1970, Ser. No. 37,271

Int. Cl. H05b *1/02*

U.S. Cl. 219—496 **3 Claims**

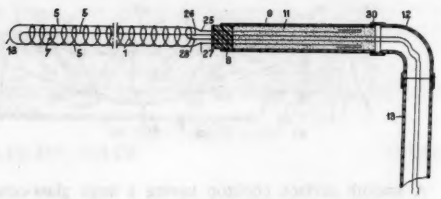
An electronic heater control system for maintaining the vapor pressure within a vacuum bakeout system at an optimum level by causing the heating elements to be alternately energized and de-energized at a high frequency with the ON-OFF duty cycle being determined by the instantaneous vapor

pressure in the system. The control circuitry includes a means for generating a time varying reference signal and a signal comparator means for comparing a pressure responsive signal



to the reference signal. The comparator means then generates a heater control signal in response to the comparison for use in driving a heater energization switching means.

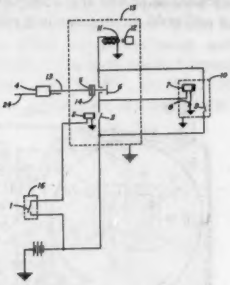
3,674,985
IMMERSION HEATER ELEMENT
Beatrice Ragault, 27 Bois Jerome par Vernon, France
Filed Jan. 14, 1971, Ser. No. 106,484
Claims priority, application France, Jan. 16, 1970, 7001495
Int. Cl. H05b *3/06*
U.S. Cl. 219—523 **4 Claims**



An immersion heater comprising essentially a coil obtained by winding coilwise cable sections adapted to heat in their central portions and remain cold at their ends, and a tube containing the cold outlets of said coil and of a connector for securing the immersion heater to the edge of the vessel containing the fluid to be heated is characterized in that the turns of the coil are supported by flexible and resistant longitudinal rodlike elements assembled on the same side of the coil as the cold ends thereof, and sealed in the outlet tube. This immersion heater further comprises an electrical relay following the fastening connector. The coil and tube assembly is housed in an insulating sheath formed with slots.

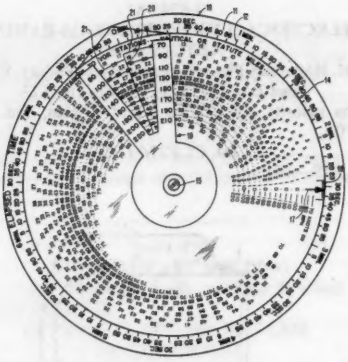
3,674,986
AUTOMATIC OCCUPIED TRIP COUNTING APPARATUS
Pascual S. Paz, 9073 Hormiga Street, Rizal, Philippines
Filed Feb. 16, 1971, Ser. No. 115,445
Int. Cl. G07b *13/00*
U.S. Cl. 235—30 A **2 Claims**

An apparatus that automatically counts and registers all occupied trips of a vehicle, partly actuated by the rotation of the vehicle wheel and partly by the occupant's weight, and which



is also actuated by pulling down the taximeter flag.

3,674,987
AIRCRAFT NAVIGATIONAL CALCULATOR
Nunzio P. Addabbo, P.O. Box 926, Copperhill, Tenn.
Filed June 16, 1971, Ser. No. 153,571
Int. Cl. G06c *3/00*; G06g *7/78*
U.S. Cl. 235—88 **10 Claims**



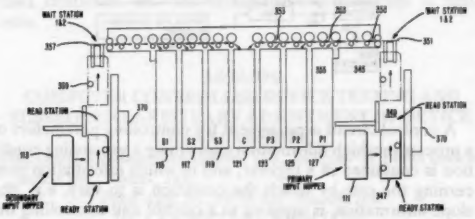
A calculator, which enables a pilot of an aircraft to determine the distance of the aircraft from a VOR station when the ground speed of the aircraft is known or the ground speed of the aircraft when the distance of the aircraft from the VOR station is known, includes a circular base member having a scale in terms of time thereon. A member is rotatably mounted on the base member and has a plurality of concentrically arranged scales in terms of distance to the VOR station with each scale being for a different ground speed of the aircraft. When a pointer on the rotatable member is aligned at the time required to fly between two bearing radicals of the VOR station that are 20° apart, a transparent fixed indicator having a hairline radially aligned with the center of rotation of the rotatable member and concentrically arranged marks engaging the hairline with each mark representing one of the ground speeds of the aircraft enables either the distance of the aircraft from the VOR station to be determined with the ground speed known or vice versa. The base member has three circular concentric scales on its opposite side divided into 10° increments to indicate the required heading of the aircraft to fly between two bearing radials that are 10° apart.

3,674,988

MACHINE TO READ INFORMATION FROM PUNCHED CARDS FOR THE PURPOSE OF DATA PROCESSING SAID INFORMATION AND FOR THE PURPOSE OF SORTING, COLLATING AND MERGING SAID PUNCHED CARDS IN ACCORDANCE WITH SAID PROCESSED INFORMATION

Joseph Pirra Francini, Norristown, Pa.; James Lopez Braxton, Jr., Morrestown, N.J.; Vera Gloria Lewis, Philadelphia, Pa.; Frank Henderson McPherson, Rosemont, Pa.; Daniel Rosenberg, Norristown, Pa., and Torkjell Sekse, Norristown, Pa., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Oct. 19, 1964, Ser. No. 404,758
Int. Cl. G05b *1/00*; G06k *15/00*
U.S. Cl. 235—61.7 33 Claims



The present apparatus provides two read stations which simultaneously read cards at a high rate of speed and two associated transport means which enable cards to be transported toward a common receiving station and which are capable of transporting punch cards of various sizes. In addition the high speed transport systems have means to readily remove card jams. Further each of the transport systems has a waiting station therein which holds two cards simultaneously, each of said cards having been previously read and each of said cards being compared with a third card being transported through the associated read station. In addition the system provides an arithmetic means as well as a comparison means in order to permit the information from the cards to be processed arithmetically, i.e., added or subtracted and to be compared with a standard value or with an answer arrived at by virtue of the arithmetic process. Yet further the present system provides an editing means for inserting or deleting information as well as a means for translating from one code to another to accommodate a prescribed checking sequence priority. Another feature is the read-in and read-out means by virtue of which the present system may be used as a peripheral device with another data processor.

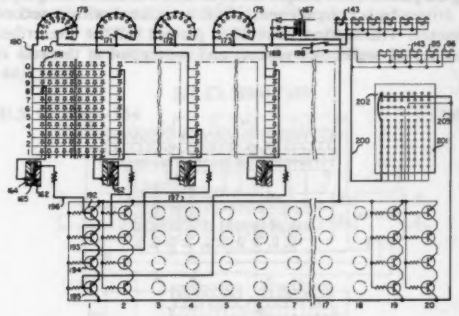
3,674,989

PUNCH CARD CONTROLLED ACCOUNTING MACHINE

Charles S. Nagy, Dayton, Ohio, assignor to The National Cash Register Company, Dayton, Ohio

Filed Feb. 12, 1971, Ser. No. 114,792
Int. Cl. G06k *15/06*
U.S. Cl. 235—61.6 R 11 Claims

An accounting machine in which a perforated control card insertable into the machine programs the control of a plurality of feeding and printing mechanisms by predetermined control keys on the keyboard. Control circuits are utilized which include differentially settable switch means, sensing means for sensing perforations in the control card and a plurality of "AND" gates for selectively operating electromagnetic means



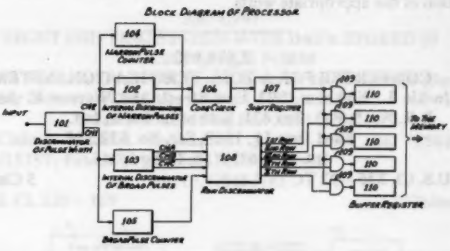
which control the feeding mechanism and a plurality of printing mechanisms.

3,674,990

MOVING OBJECT IDENTIFICATION SYSTEM

Noritaka Kurauchi; Shotaro Tada; Hiroshi Shima; Susumu Hiraoka; Taichiro Nagao; Masahiro Koyama; Satoshi Shiraishi; Masuo Shindo, and Yoshinobu Kobayshi, all of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed May 12, 1970, Ser. No. 36,558
Int. Cl. G06k *7/10*, *19/06*; E04g *17/00*
U.S. Cl. 235—61.11 E 16 Claims



An optical electronic system for identification of railway cars. Code plates are attached to each of the railway cars and have a plurality of vertical row arrays of wide and narrow retroreflective strips arranged with respect to each other in accordance with a predetermined alpha-numeric and row code. A light beam narrower than the narrowest retroreflective stripe is vertically scanned over the code plate repeatedly as the railway car moves therepast horizontally in order to scan each of the vertical arrays of stripes and thereby produce a train of reflected light pulses which are then converted to electric pulses and decoded by measuring the pulse widths and intervals.

3,674,991

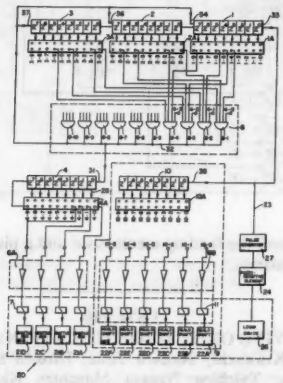
AUTOMATIC PROGRAMMING DEVICE FOR LOOMS

Krum Kostov Isvetkov; Ezekiya Gueorguiev Ezekiev, both of Sofia; Petko Petrov Nikolov, and Vassil Christov Otsetov, both of Samokov, all of Bulgaria, assignors to DSO Avtomatizatsia I Priborostroene, Sofia, Bulgaria

Filed Jan. 6, 1971, Ser. No. 104,446
Int. Cl. G07c *3/10*
U.S. Cl. 235—92 PD 5 Claims

A prescribed program of weft color repeats for a loom is represented by stored counts in a plurality of binary counters.

During each of a succession of operating cycles of the loom in which wefts of the same color are to be repeated, the loom shuttle box assigned to that color is actuated by a corresponding output of a first one of the counters, whose counting input is driven by a coincidence circuit associated with a second counter. The second counter is pre-set for the prescribed number of weft color repeats and is stepped at the rate of



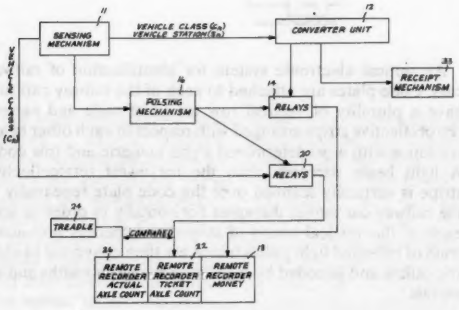
operation of the loom. When the last weft of that color repeat is inserted, the second counter excites the coincidence circuit to step the first counter. This action excites the shuttle box associated with the next weft color. A third counter stepped in synchronism with the stepping of the second counter selectively activates the loom heald shafts in preparation for insertion of the appropriate wefts.

3,674,992

CONVERTER FOR A TOLL VERIFICATION SYSTEM

Jackie L. Kirkham, 802 East Street, and Warren E. Jones, R.R. No. 5, P.O. Box 421, both of La Porte, Ind.

Filed June 11, 1969, Ser. No. 832,395
Int. Cl. B61l 1/16; G08g 1/065
U.S. Cl. 235—92 TC **5 Claims**



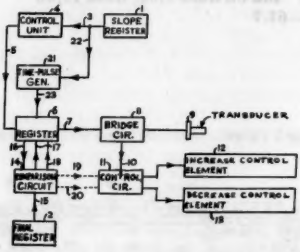
A converter for use in cooperation with a ticket sensing means and toll recorder in a toll verification system. Means are provided for producing a plurality of pulsed signal sequences to actuate the toll recorder. A plurality of switch means are provided in which each switch means controls the emission of a specific pulsed signal sequence. Means are included for receiving first and second output signals from the ticket sensing means and converting said signals into at least one switching signal which actuates a selected switch means to permit the pulsed signal sequence controlled thereby to activate the toll recorder.

3,674,993

CONTROL CIRCUIT ARRANGEMENT FOR CONTROLLING PARAMETERS OF A PROCESS AND A COMPARISON CIRCUIT ARRANGEMENT FOR USE IN CONJUNCTION WITH THE CONTROL CIRCUIT ARRANGEMENTS

Robert Mienstaedt, Spartanburg, S.C., assignor to Deering Milliken, Inc.

Filed July 15, 1968, Ser. No. 46,563
Int. Cl. G05b 19/02
U.S. Cl. 235—150.1 **5 Claims**



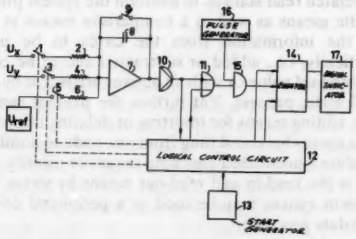
A control circuit arrangement for controlling parameters of a process in which information concerning a processing condition is contained in a register, and in which information concerning the rate by which the condition is to vary, e.g., the slope information, is supplied to a control unit controlling the register. The register is a digital register and the control unit is arranged to supply a pulse to the register each time a period, depending on the slope information, has elapsed whereby the register will alter its contents by a certain value in a direction determined by the desired find condition.

3,674,994

METHOD AND APPARATUS FOR MULTIPLYING ANALOG ELECTRICAL QUANTITIES

Volker Zimmermann, Viernheim, Germany, assignor to Brown, Boveri & Cie., A.G., Mannheim-Kaferstal, Germany

Filed Nov. 24, 1969, Ser. No. 879,392
Int. Cl. G06g 7/16; G06J 1/00
U.S. Cl. 235—150.52 **10 Claims**



Apparatus for multiplying analog electrical quantities comprises an integrator, such as a Miller integrator, to whose input can be selectively applied two or more electrical quantities, in the form of positive voltages, or a reference voltage, which is a negative voltage. The output of the integrator is connected to a signal range indicator whose output is connected to the inverted input of an OR gate and to a logical control circuit connected to the output of a start generator. The logical control circuit is connected to the non-inverted input of the OR gate, and the OR gate is connected to one input of an AND gate whose other input has connected thereto a post generator.

The output of the AND gate is connected to a counter whose counting direction is controlled by the logical control circuit, and the counter-output is connected to a digital indicator. To multiply the analog electrical quantities, the logical control circuit is activated to apply the first electrical quantity to the integrator and simultaneously to open the AND gate for transmission of a predetermined number of pulses from the pulse generator to the counter counting in the forward direction. After counting of the predetermined number of pulses, the first electrical quantity is disconnected at a first given time and the reference voltage is applied to the integrator while resetting the counter toward zero, until the voltage at the integrator output is zero at a second time. The reference voltage is then disconnected and a second electrical quantity is applied to the integrator while pulses are transmitted to the counter which is still counting in the backward direction, until the counter reading is zero. When the counter reading is zero, the second electrical quantity is disconnected at a third given time, the counter is set to count in the forward direction and the reference voltage is again applied to the integrator while the pulses are transmitted to the counter. The pulse count is then continued until the integrator output voltage is again zero.

3,674,995

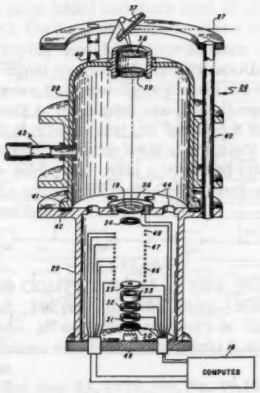
COMPUTER CONTROLLED DEVICE TESTING AND SUBSEQUENT ARBITRARY ADJUSTMENT OF DEVICE CHARACTERISTICS

Don Leslie Kendall, Richardson, Tex., assignor to Texas Instruments Inc., Dallas, Tex.

Filed Aug. 31, 1970, Ser. No. 68,100

Int. Cl. G06f *15/46*; G05b *15/00*

U.S. Cl. 235—151.1 **21 Claims**



A system for arbitrary adjustment of device characteristics to produce parameter matched arrays or to do custom design utilizes computer control. The computer is linked with electron beam scanned testing to derive individual device characteristic information such as breakdown voltage, leakage, and switching time. From such derived information the computer generates a signal back to the electron beam, increasing its current intensity to heat the device and thereby change the device's characteristic properties. If bulk breakdown voltage is too low, for example, increased current intensity shifts the material toward n-type if done at about 500° C. in an N^+p diode, this would increase bulk breakdown voltage. When it reaches the predetermined (computed) level, the beam cuts off.

3,674,996

CONVERSION SYSTEM USING A CONVERSION TABLE

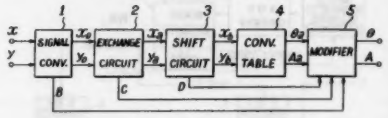
Hidetaka Yanagidaira, Ohmiya; Kazuo Kawai, and Sotokichi Shintani, both of Tokyo-to, all of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo-to, Japan

Filed Sept. 8, 1970, Ser. No. 70,403

Claims priority, application Japan, Sept. 12, 1969, 44/72461

Int. Cl. H04l *3/00*

U.S. Cl. 235—154 **5 Claims**



A conversion system for converting input information indicated by at least two input code units to output information indicated by at least two output code units by the use of a conversion table, in which the two input code units are shifted before application to the conversion table in the direction to upper digits until the most significant digit of a code unit indicative of an absolute value of one of the two input code units assumes one of two possible states of binary information so that the most significant digit of the two input code units applied to the conversion table do not at all assume the other of two possible states of binary information. Particular combinations of the two input code units having a condition in which a particular one of the two input code units is larger than the other may be excluded by exchanging the two input code units for each other.

3,674,997

RIGHT SHIFTING SYSTEM WITH DATA STORED IN POLISH STACK FORM

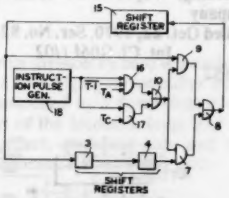
Goro Hamano, Osaka-shi, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Osaka, Japan

Filed Feb. 16, 1970, Ser. No. 11,385

Claims priority, application Japan, Feb. 26, 1969, 44/15197; Feb. 26, 1969, 44/15198

Int. Cl. G06f *7/48*

U.S. Cl. 235—159 **2 Claims**

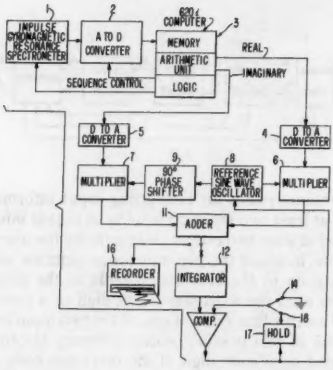


A right shifting system of a circulating register storing a plurality of time-space registers in serial of bits, in time division serial of time-space registers and in serial of digits. The system has a first shift register means, a second shift register means which receives output signals from the first shift register means, an input gate means which feeds input signals from both shift register means and for which two signal paths are provided, the first path receiving output signals from the first shift register means and the second path receiving output signals from the second shift register means, and a control circuit means which is coupled to the input gate means and which controls input signals to the input gate means from the two signal paths selectively so that the right shifting operation of the contents of at least two time-space registers of the plurality of time-space registers is completed.

3,674,998
METHOD AND APPARATUS FOR AUTOMATIC PHASE CONTROL IN A FOURIER ANALYZED READOUT OF IMPULSE RESONANCE DATA

Hanspeter Benz, Santa Clara County, Calif., assignor to Varian Associates, Palo Alto, Calif.

Filed March 4, 1970, Ser. No. 16,497
Int. Cl. G01r *33/08*
U.S. Cl. 235—151.3 **14 Claims**

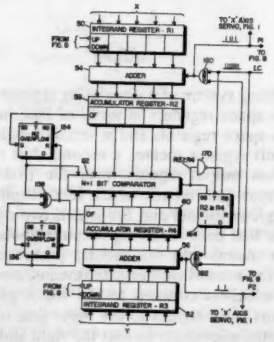


Method and apparatus for storing and reading out impulse resonance spectral data is disclosed. Impulse resonance spectral data containing a plurality of simultaneous Fourier components are added and time averaged in a computer or storage and adder. The stored resonance data is then Fourier analyzed to obtain a complex reference resonance line output containing a sum of both the real and imaginary parts of the time averaged resonance component. The resonance component is then analyzed for line symmetry to obtain an output representative of line symmetry. The line symmetry output is employed for changing the phase of both the real and imaginary components of the Fourier analyzed resonance component to reduce either the real or complex part of the resonance component to zero to obtain pure absorption or dispersion mode resonance spectra output.

3,674,999
NUMERICAL FUNCTION GENERATOR

Leroy U. G. Kelling, Waynesboro, Va., assignor to General Electric Company

Filed Oct. 22, 1970, Ser. No. 82,979
Int. Cl. G06f *1/02*
U.S. Cl. 235—152 **18 Claims**

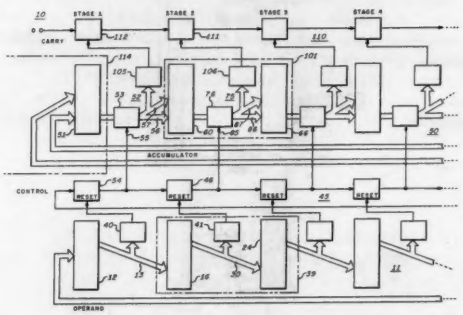


A numerical function generator for use with numerical control systems in generating linear and nonlinear numerical functions including circular and parabolic functions. The input data indicative of the desired numerical function is stored in two separate integrand registers which are individually associated with digital adders so that their contents can be selectively added to the contents of two separate accumulator registers. The contents of the two accumulator registers are compared by a bit comparator in order to indicate which of the two accumulator registers presently has the larger number stored therein. As a result of this comparison, the integrand register associated with the accumulator register having the smallest number is added to that accumulator register until such time as the situation reverses itself. At this time, the contents of the other integrand register are added to its associated accumulator register. Two separate pulse frequency digital signals are generated as a result of the addition operations referred to above. The basic function generator described heretofore is then modified so as to generate circular arcs by increasing the contents of one integrand register and decreasing the contents of the other integrand register as the function is generated. A further modification contemplates increasing (or decreasing) the contents of one integrand register while maintaining the contents of the other integrand register constant so as to generate parabolic arcs.

3,675,000
APPARATUS FOR ARITHMETIC OPERATIONS BY ALERTING THE CORRESPONDING DIGITS OF THE OPERANDS

Andrew J. Lincoln, Concord, and Karl S. Menger, Cambridge, both of Mass., assignors to Sperry Rand Corporation

Filed Aug. 6, 1970, Ser. No. 61,527
Int. Cl. G06f *7/50*
U.S. Cl. 235—168 **28 Claims**

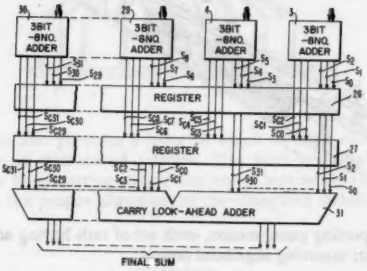


Apparatus for arithmetically combining the values of two numbers, for example adding and subtracting, comprising a first shift register for storing one of the numbers with stages interconnected to diminish the values of the digits of the one number by predetermined amounts, respectively, as the digits thereof transfer between the stages. A second shift register for storing the other number is included for increasing the values of the digits of the other number corresponding to the digits of the one number, respectively, by the corresponding predetermined amounts, as the digits of the other number transfer between the stages thereof. The digits of the other number are increased until the corresponding digits of the one number attain the values zero, respectively.

3,675,001
FAST ADDER FOR MULTI-NUMBER ADDITIONS

Shanker Singh, Beacon, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 10, 1970, Ser. No. 96,875
Int. Cl. G06f 7/50
U.S. Cl. 235—175 5 Claims



A fast adder for adding more than three numbers, the digits of each of which are arranged in groups in accordance with the expression $n=[\log_2(k-1)]$ where:

$[\log_2(k-1]$ is the smallest integer greater or equal to $\log_2(k-1)$

n = the number of digits in each group and

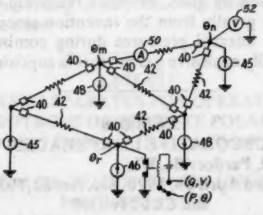
k = the number of numbers to be added.

The most significant digit of each group of digits comprising each number to be added is applied to an adder which directly produces a partial sum consisting of a sum digit and carry digits. In the next cycle of operation, the second most significant digit of each group of digits is applied to the same adder to produce a corresponding partial sum in the same manner. Then, the third most significant digit of each group of digits is applied to the same adder and so on until all of the digits have been processed. Each partial sum includes a number of digits having overlapping positional significance (weight) with respect to an equal number of digits of another partial sum. However, no more than two digits possess the same positional significance. Half of the digits from all of the partial sums are applied to a first register and the remainder of the digits are applied to a second register with appropriate positional significance. One additional cycle is required in order to apply the digits in the two registers to a carry look-ahead adder to yield the desired final sum.

3,675,002
SYSTEM FOR COMPUTING ELECTRIC POWER FLOW

Tsuneo Mitsui, Tokyo; Jun-Ichi Baba, Kobe, and Ikuo Yamada, Kobe, all of Japan, assignors to Tokyo Denryoku Kabushiki Kaisha and Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed June 23, 1970, Ser. No. 49,122
Int. Cl. G06g 7/50
U.S. Cl. 235—185 4 Claims



Disclosed herein is a simulated power system including a network of resistances, power sources, and loads corresponding respectively to line reactances, generators, and loads of an actual power system, and further including measuring devices for determining voltages and current flow between selected nodes (e.g. m and n) of the network, wherein the active power Pmn and the reactive power Qmn through the branch between the nodes can be calculated rapidly according to the formulas

$$Pmn=\frac{\theta m-\theta n}{Xmn}, \text{ and}$$

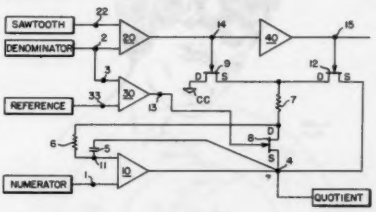
$$Qmn=\frac{\Delta Vm-\Delta Vn}{Xmn},$$

where θm and θn are the phase angles at the respective nodes and are proportional to the voltages at the nodes, and ΔVm and ΔVn are difference voltages between actual and standard voltages at the selected nodes. In the simulated system the power sources are provided by constant current supply devices or constant voltage devices, and the load units are provided by constant current withdrawal devices, wherein the power sources and loads are connected to predetermined nodes of the network.

3,675,003
SYSTEMS INVOLVING DIVISION

John Somerville Snyder, Webster, N.Y., assignor to Sybron Corporation, Rochester, N.Y.

Filed Aug. 27, 1970, Ser. No. 67,435
Int. Cl. G06g 7/16
U.S. Cl. 235—196 7 Claims



A system wherein division by zero is avoided. A numerator voltage is applied to a high gain amplifier having a negative feedback loop controlled by a denominator voltage which if zero disables part of the feedback loop. The effect of this is avoided by, in effect, replacing this part of the loop in response to the denominator becoming zero.

3,675,004
PHOTOFLASH LAMP AND MULTIPLE FLASHLAMP SYSTEM

Earl A. Gulbrasen; Richard L. Tallman, both of Pittsburgh; Kenneth F. Andrew, East Pittsburgh, all of Pa., and Bruce T. Buzalski, Dover, N.J., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 15, 1970, Ser. No. 46,378
Int. Cl. G03b 15/02
U.S. Cl. 240—1.3 11 Claims

An improved combustible photoflash lamp is described which produces an increased peak and integrated lumen output per unit lamp volume, and an improved color temperature of light output. The combustible comprises shredded foil substantially comprised of hafnium metal which is burned in a

super pressure oxygen atmosphere. The shredded foil cross-sectional area can be varied to further vary the color temperature of the light output. The lamp envelope including the protective lacquer coating on the exterior thereof is substantially

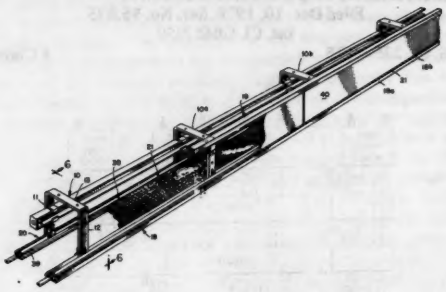
transmissive of all visible radiations generated upon operation of the lamp. This lamp eliminates the need for a light-absorbing, color-correcting blue lacquer coating in order to achieve a high color temperature of light output. The lamp is conveniently utilized in an improved multiple flashlamp system.

3,675,005
COIFFEUR DECORATING APPARATUS
Raymond F. Curiel, 7100 East Hummingbird Lane, Paradise Valley, Ariz.
Filed Jan. 21, 1970, Ser. No. 4,687
Int. Cl. F21v *33/00*
U.S. Cl. 240—2 **1 Claim**

Apparatus for securing in a lady's coiffeur including a tubular member having a battery and lamp secured therein. A plurality of optic fibers are clamped and are mounted adjacent the lamp. The tubular member is enclosed within a flexible mesh to facilitate securing the tubular member within the coiffeur; the fibers may then subsequently be combed into the hair to provide a decorative light pattern. A removable lens is positioned between the lamp and the clamped ends of the fibers to permit changing the color of the light being transmitted by the optic fibers.

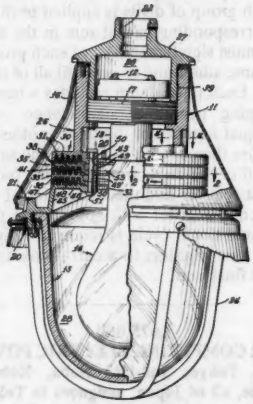
3,675,006
ROOM LIGHTING INSTALLATION
Samuel J. Zagel, Oak Park, and Thomas H. Patton, Niles, both of Ill., assignors to Compco Corporation, Chicago, Ill.
Filed Jan. 12, 1972, Ser. No. 217,357
Int. Cl. F21v *21/02, 21/34*
U.S. Cl. 240—9 R **3 Claims**

A room lighting installation having a plurality of aligned U-shaped brackets interconnected and supporting three sets of rails each having rail sections aligned end to end, two of the sets of rails being at the bottom of the brackets and supporting horizontal light diffuser means, the third set of rails being positioned above one of the other sets and cooperating therewith



in supporting panel means, each set of rails having additional ways for receiving alignment means.

3,675,007
EXPLOSION PROOF LIGHTING FIXTURE
Norton A. Appleton, Northfield, and Herbert W. Penzel, Chicago, both of Ill., assignors to Appleton Electric Co., Chicago, Ill.
Filed Oct. 20, 1969, Ser. No. 867,438
Int. Cl. F21v *25/00*
U.S. Cl. 240—11.2 E **2 Claims**

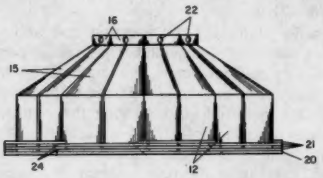


An explosion suppressing vent for an electrical fixture which includes continuous flame-arresting channel of air space passing through the fixture wall and connecting air-space within the fixture with exterior air. Electrical fixtures partially enclosed by glass, or other relatively fragile membranes, benefit greatly from the invention since, through its use, maximum internal pressures during combustion of enclosed potentially explosive gas mixture is suprisingly low.

3,675,008
DECORATIVE LAMP SHADES
Clifford W. Hill, Pardeeville, Wis.
Filed April 29, 1970, Ser. No. 32,793
Int. Cl. F21v *1/00*
U.S. Cl. 240—108 **1 Claim**

A lamp shade that is decorative and which can also be sold in "kit form" to be built by hobbyists, to be used as a kit for

both educational purposes and for manual dexterity training, and which can also be easily assembled by handicapped persons such as the blind. The lamp shade has a translucent colored plastic liner which provides the inner portion of the



shade and also provides a form on which to stack elongated members in interleaved relation. The liner and elongated members have corresponding alignment indicia on them to facilitate the proper alignment of the elongated members on the liner.

3,675,009

CARBON BLACK BLENDING IN RUBBER

Gerard Kraus, Bartlesville, Okla., assignor to Phillips Petroleum Company

Filed May 18, 1970, Ser. No. 38,523
Int. Cl. G01n *23/04*
U.S. Cl. 250—49.5 R **6 Claims**

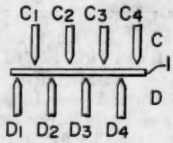
A method has been developed for predicting the relative abrasion index of a rubber into which carbon black is blended, depending upon a particle size distribution relationship of the carbon black.

3,675,010

ELECTRICAL CHARGING DEVICE

Wilhelm Josef Knechtel, Rodheim, and Detlef Schaffer, Wetzlar, both of Germany, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed July 13, 1970, Ser. No. 54,334
Claims priority, application Germany, July 16, 1969, P 19 36 168.3
Int. Cl. G03g *15/00*
U.S. Cl. 250—49.5 ZC **8 Claims**



Corona discharge apparatus incorporating an electrode assembly comprising needle electrode pluralities providing corona discharge at opposite sides of a longitudinal passage in the apparatus through which a chargeable member is moved. Electrodes are spaced particularly in lateral and longitudinal manner for providing a uniform electrical charge on the chargeable member.

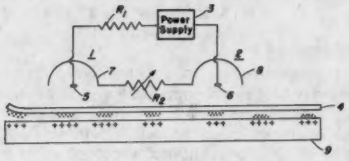
3,675,011

METHODS AND APPARATUS FOR OPERATING PAIRED COROTRONS OF OPPOSITE POLARITY

Morton Silverberg, Rochester, N.Y., assignor to Xerox Corporation

Filed Jan. 21, 1971, Ser. No. 108,304
Int. Cl. G03g *15/00*
U.S. Cl. 250—49.5 ZC **9 Claims**

Methods and apparatus for applying opposite polarity, equal magnitude charging currents to a surface to be charged are provided according to the present invention. In accordance with one embodiment of the present invention at least two corotrons are energized by a floating power supply exhibiting substantially constant current characteristics. The positive terminal of the floating power supply is connected to a coronode of one of the at least two corotrons while the negative terminal of the floating power supply is connected to the



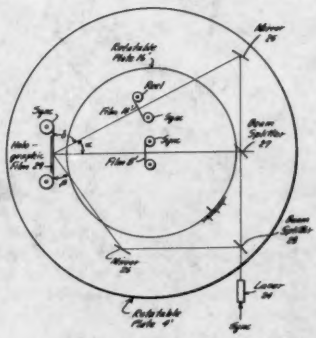
coronode of another one of such at least two coronodes. Additionally, the shields of each of such at least two corotrons are interconnected through a current limiting impedance so that current flow between the shields of the at least two corotrons is maintained within a selected range whereupon the ion charging current produced by each of the corotrons is maintained at substantially uniform magnitude levels.

3,675,012

CINEFLUOROGRAPHIC HOLOGRAPHY

George Derderian, Maitland, Fla., and Joseph L. De Clerk, Red Bank, N.J., assignors to The United States of America as represented by the Secretary of the Navy

Filed Oct. 15, 1970, Ser. No. 80,877
Int. Cl. G01n *23/04*; G02b *27/22*
U.S. Cl. 250—60 **1 Claim**



Two motion picture cameras are arranged to photograph the fluoroscopic image derived from two respective X-ray or other energy beams which pass through a subject at respectively different angles. The motion picture films are developed and used in steroscopic pairs to make holograms on a third motion picture film. The information on the third film provides a three dimensional motion picture holographic image of the subject.

3,675,013
IMAGE-CARRYING FILM FOR USE AS AN ORIGINAL FOR PROJECTION AND ITS MANUFACTURING METHOD

Keishi Kubo, and Kiyoshi Sakai, both of Tokyo, Japan, assignors to Kabushiki Kaisha Ricoh, Tokyo, Japan

Continuation-in-part of Ser. No. 758,668, Sept. 10, 1968, abandoned, and a continuation-in-part of Ser. No. 771,287, Oct. 28, 1968, abandoned, and a continuation-in-part of Ser. No. 805,842, March 10, 1969, abandoned. This application Nov. 6, 1970, Ser. No. 87,584
Int. Cl. G01d *15/10*

U.S. Cl. 250—65 T **12 Claims**

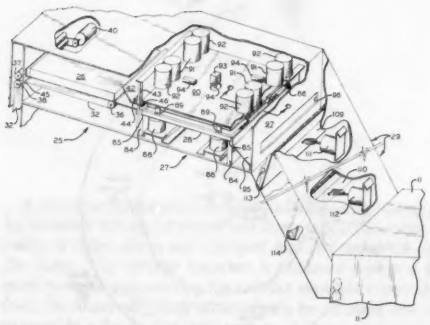
The invention relates to a diapositive polypropylene film transparency that is self-supporting and dimensionally stable to conditions of storage and use having at least 60 percent of parallel luminous transmittancy to visible light rays at a thickness of 50 μ or more and a method of its manufacture which comprises placing a transparent undeveloped polypropylene film having a heat-shrinking coefficient less than 15 percent in both biaxial directions in juxtaposition with an infrared absorbing image and transmitting infrared irradiation through the polypropylene film to the original image to create on the film a corresponding light diffusive image comprised of fine undulations of the surface and low light transmittancy, the finished film being useful for projecting said image upon a reflecting screen as a corresponding unilluminated image in contrast to the corresponding transparent portion as an illuminated area.

3,675,014
LIGHT-PROOFED AUTOMATIC RADIOGRAPHIC CASSETTE UNLOADER-RELOADER

Theodore Perl, Fayetteville, N.Y.

Filed April 9, 1971, Ser. No. 132,743
Int. Cl. H05g *1/60*

U.S. Cl. 250—66 **9 Claims**



A light-proof cabinet housing has separate layers or modules for different sizes of cassettes. Each module has electrically operated means for opening the cassette, raising the cover, marking the film therein, extracting the film and feeding the film to a conventional processor. In each module means are provided for storage of a fresh supply of film and also electrically operated means for extracting one sheet at a time and feeding it to the opened cassette, then closing the cassette. Electrical sequencing means are provided for automatic operation, or for initially loading an empty cassette, and for stopping the machine upon any malfunction. A modified form of cassette is provided adapted to cooperate with cassette opening means in each module.

3,675,015
ABHESIVE PATTERN DETECTOR SYSTEM

Thomas E. Geib, Florissant, Mo., assignor to Weyerhaeuser Company, Tacoma, Wash.

Filed Sept. 2, 1969, Ser. No. 854,440
Int. Cl. G01n *21/16*

U.S. Cl. 250—71 R **4 Claims**

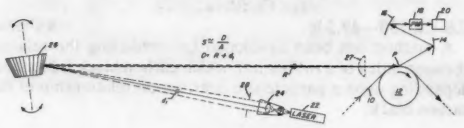
A system for detecting the location and uniformity of a coating on a substrate is provided. The process comprises the steps of adding a fluorescent dye material to the coating material, coating the substrate with the fluorescent dye-containing coating material, and viewing the pattern obtained thereby under an ultraviolet light source. A gable-top container employing a non-heat sealing coating containing a fluorescent dye on a portion thereof is described. The fluorescent dye is used to aid in evaluating the location and uniformity of the coating.

3,675,016
FLYING SPOT SCANNING

William H. Blaisdell, Rochester, and Edward C. Cornelius, Fairport, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 17, 1970, Ser. No. 12,083
Int. Cl. H01j *39/00*

U.S. Cl. 250—83.3 H **1 Claim**



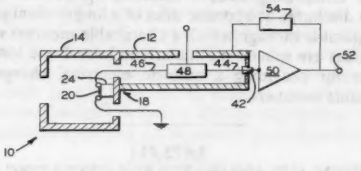
A flying spot scanner system is disclosed which obviates the prior art use of a large expensive lens by reflecting focused light off a multifaceted mirror to the element being scanned. The spot is made invariant and as small in size as possible by defining the dimensions of the focused beam so that only part, preferably half, of a mirror facet is illuminated during scanning; and by locating the mirror as close to the element being scanned as will allow the spot to be formed of all of the light beamed at the mirror. The source of illumination is a laser; and uniform spot intensity during scanning is assured by a suitably dimensioned stop.

3,675,017
SHIELDED PYROELECTRIC DETECTOR APPARATUS AND METHOD

Walter M. Doyle, 5 Arnold Avenue, Utica, N.Y.

Filed Aug. 10, 1970, Ser. No. 62,286
Int. Cl. G01j *5/02*

U.S. Cl. 250—83.3 H **9 Claims**

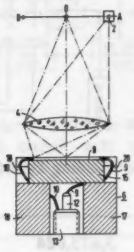


A method and apparatus for providing a pyroelectric detector with stray capacitance reducing shielding is disclosed herein. In order to minimize stray capacitance of the detector, the housing of the detector is coupled to the output of the detector output signal amplifier through a suitable feedback network to maintain the housing at output signal potential. The capacitive impedance between the housing and the various electrical leads is then apparently infinite.

3,675,018
SEMICONDUCTOR TYPE RADIATION DETECTOR

Bernt Paul, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Dec. 3, 1970, Ser. No. 94,640
Claims priority, application Germany, Dec. 9, 1969, P 19 61 576.0
Int. Cl. G01j 5/20
U.S. Cl. 250—83.3 R 3 Claims

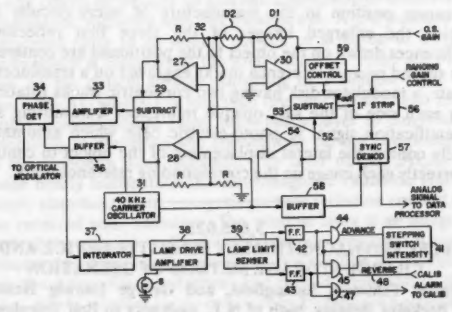


An apparatus for detecting radiation emanating from a source movable along a path has an elongated radiation-sensitive electronic semiconductor of a first crystalline phase. The semiconductor is positionable substantially parallel to the path. Inclusions of a second crystalline phase are contained in the semiconductor and have an electrical conductivity higher than the first phase. The inclusions are orientated substantially perpendicular to the current flow in the semiconductor response to the radiation. Two magnetic structures are disposed one behind the other laterally of the semiconductor along its longitudinal dimension and have respective magnetic fields which penetrate the semiconductor in mutually opposite directions.

3,675,019
APPARATUS FOR MEASURING THE AMOUNT OF A SUBSTANCE THAT IS ASSOCIATED WITH A BASE MATERIAL

Robert C. Hill, Santa Clara; John M. French, San Jose, and Richard E. Toepfer, Campbell, all of Calif., assignors to Measurex Corporation, Santa Clara, Calif.

Division of Ser. No. 799,784, Feb. 17, 1969, Pat. No. 3,614,400. This application March 19, 1971, Ser. No. 126,209
Int. Cl. G01n 23/00, 21/26
U.S. Cl. 250—83.3 D 1 Claim

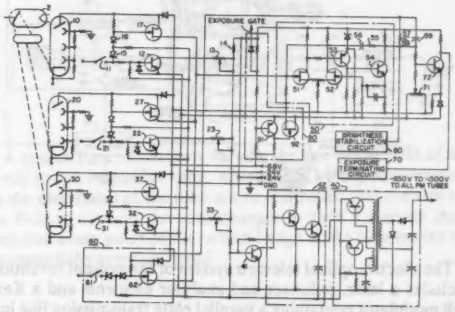


A moisture gauge for paper material includes an infrared source and two detectors one of which is responsive to a wavelength of 1.94 microns which is sensitive to moisture in the paper; the other detector is responsive to 1.8 microns which is not affected by moisture. The operating point of the detector not sensitive to moisture is maintained constant by a feedback system. At the same time an impedance ratio of the two detectors provides information as to absolute moisture content. Automatic standardization of the system is also provided.

3,675,020
X-RAY TUBE CONTROL CIRCUITRY

Melvin P. Siedband, Baltimore; Philip A. Duffy, Jr., Catonsville, and Jack L. James, Baltimore, all of Md., assignors to CGR Medical Corporation, Cheverly, Md.

Filed Sept. 24, 1969, Ser. No. 860,603
Int. Cl. H05g 1/30
U.S. Cl. 250—93 8 Claims

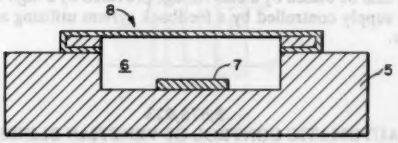


Simple unified circuitry for use in controlling an X-ray generator for combining a selected photomultiplier tube with an operational amplifier which is either in an integrator mode or signal amplifier mode depending on whether radiographic procedures, fluoroscopic procedures or cine procedures are to be used.

3,675,021
METAL OXIDE FILM STRUCTURE

Abraham Aladjem, Holon, Israel, assignor to State of Israel, Atomic Energy Commission, Beer-Sheba, Israel

Filed Sept. 19, 1969, Ser. No. 859,310
Claims priority, application Israel, Sept. 26, 1968, 30770
Int. Cl. G21h 5/00
U.S. Cl. 250—106 S 13 Claims

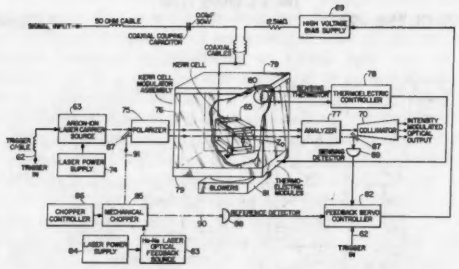


The invention provides metal oxide film structures for use as radioactive radiation windows, membranes of electrolytic cells and other purposes. The structures consist of an annular, or other closed frame of tantalum, niobium, tungsten or zirconium integral with a thin film of an oxide of the same metal, which spans the area enclosed by the frame. The structure is manufactured by subjecting a blank of the metal concerned, centrally masked on the larger part of the surface, to an anodizing treatment producing the oxide on all not-masked parts, removing the mask and subjecting the oxide-covered blank, as anode, to an electrolytic process by which the not-oxidized metal except the marginal portion, which constitutes the frame, is dissolved.

3,675,022
KERR CELL SYSTEM FOR MODULATING A LASER BEAM

Melvin A. Nelson; Jerry G. Lackey, and Terence J. Davies, all of Santa Barbara, Calif., assignors to The United States of America as represented by the United States Atomic Energy Commission

Filed May 21, 1970, Ser. No. 39,345
Int. Cl. H04b 9/00
U.S. Cl. 250—199 1 Claim



The electro-optical telemetr system of the present invention includes a laser, polarizer and analyzer elements and a Kerr cell modulator containing a parallel plate transmission line immersed in a birefringent liquid such as nitrobenzene. The modulating signal is applied to the parallel plate transmission line which is terminated in its characteristic impedance. Preferably, the laser beam is directed into the modulator at an angle equal to

$$\cos^{-1}\frac{n}{\sqrt{e}}$$

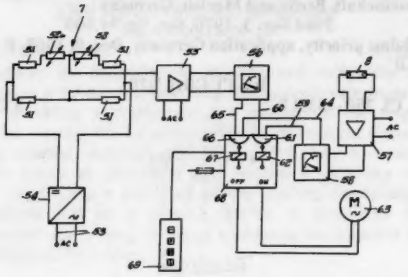
where n and e are the index of refraction and the dielectric coefficient, respectively, of the birefringent liquid. Two parallel mirrored surfaces may be used to make the laser beam traverse the modulator a plurality of times. An environmental chamber containing a liquid bath and a thermo-electrical control system may be utilized to maintain the temperature of the modulator at a predetermined point. The Kerr cell modulator may also be biased by a bias voltage provided by a high voltage bias supply controlled by a feedback system utilizing another laser.

3,675,023
AUTOMATIC CONTROL OF VENETIAN BLINDS IN RESPONSE TO BOTH HEAT AND LIGHT BEING BELOW RESPECTIVE THRESHOLD VALUES

Arthur Kunke, Oldenburg; Dieter Reinhardt, Bodenfelde, and Waldemar Glass, Gottingen, all of Germany, assignors to Justin Huppe, Oldenburg, Germany

Filed Aug. 28, 1970, Ser. No. 67,685
Claims priority, application Germany, June 25, 1970, P 20 31 428.7; Aug. 29, 1969, G 69 33 965.7
Int. Cl. E05f 15/20; G01t 1/16; H01j 3/14
U.S. Cl. 250—83.3 8 Claims

Sensing devices respectively reacting to light intensity and to heat radiation are mounted in an exposed position such as on the top of a building. The sensing devices are oriented for direct exposure to sunlight according to the direction of the sunlight at different times of day, and operate through electronic control circuits to operate electric motors, and thereby to control the amount of sunlight admitted through windows



on various sides of the building by adjusting the venetian blinds in the windows.

3,675,024
PHOTO-ELECTRIC POSITIONING DEVICE

Christian Louis Georges Benard, Paris, France, assignor to Societe Parisienne des Anciens Etablissements Barbier, Benard & Turenne, Paris, France

Filed May 26, 1970, Ser. No. 40,681
Int. Cl. H01j 39/12
U.S. Cl. 250—208 10 Claims

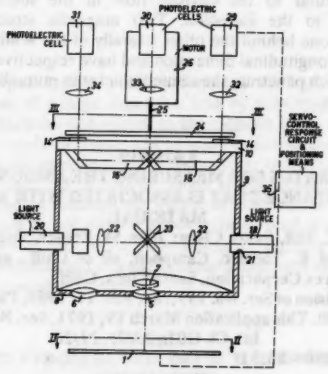


Photo-electric positioning device for adjustment to a very accurate position in the manufacture of micro-circuits in which the enlarged images of the three first reflecting references drawn on the object to the positioned are centered on second opaque reference marks engraved on a translucent plate, a modulator disk having two concentric tracks rotating on each side of the said opaque references transmitting an identification signal to photo-electric cells which automatically control the lateral displacement of the object to center correctly each image on the corresponding reference mark.

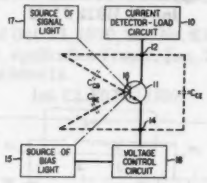
3,675,025
ELECTROMAGNETICALLY SENSITIVE DEVICE AND CHARGE STORAGE METHOD OF OPERATION

Martin Feldman, Springfield, and George Ludwig Heiter, Berkeley Heights, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 16, 1970, Ser. No. 46,646
Int. Cl. H01j 39/12
U.S. Cl. 250—211 J 15 Claims

Apparatus and method for detecting relatively low intensity electromagnetic energy with high sensitivity comprises a

transistor having a light sensitive base area, a current detector-load circuit coupled to its collector terminal, and a voltage control circuit coupled to its emitter terminal. The voltage control circuit serves to supply selective potentials to the



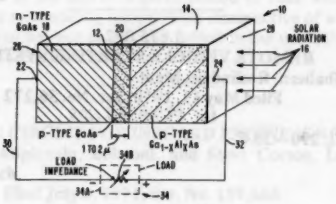
emitter terminal in order to enable or inhibit conduction. The current detector-load circuit acts as a low impedance transistor collector load and monitors changes in conduction of the transistor.

3,675,026

CONVERTER OF ELECTROMAGNETIC RADIATION TO ELECTRICAL POWER

Jerry M. Woodall, White Plains, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 30, 1969, Ser. No. 837,755
Int. Cl. H01l *15/00*
U.S. Cl. 250—211 J **6 Claims**



The converter obtains an efficient conversion of solar electromagnetic radiation into electrical power. A p-n junction is fabricated close to an optical surface of a region of n-type GaAs which is receptive of the solar radiation. There is a window on the optical surface consisting of a window layer of $Ga_{1-x}AlxAs$, where x is less than one and greater than zero with a composition to cause the window layer to contribute selectively to absorbing and transmitting certain components of the incoming solar radiation. The layer of $Ga_{1-x}Al_xAs$ is made nearly transparent to electromagnetic radiation and is nearly absorbent of the energetic particle radiation content of the received solar radiation. The window layer is an integral part of the procedure for forming the p-n junction. It contributes the p-type doping species to the junction by diffusion into the n-type GaAs substrate. For certain applications, the $Ga_{1-x}AlxAs$ window can be removed by etching with aqueous solution of HCl. If the window if removed, the ohmic contact is then made to the optical surface of the p-type GaAs.

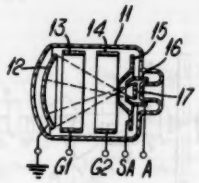
Illustratively, another structure provided by this disclosure includes a window of GaP of p-type conductivity on the surface of a region of n-type InP with a p-type transition region of InP therebetween.

3,675,027

SYSTEM FOR CONTINUOUSLY VARYING THE SIZE OF THE FIELD OF AN X-RAY IMAGE INTENSIFIER TUBE

Motohisa Tsuda, and Masao Yoshimura, both of Kyoto, Japan, assignors to Shimadzu Seisakusho Ltd., Kyoto, Japan

Filed Sept. 22, 1970, Ser. No. 74,454
Claims priority, application Japan, Oct. 3, 1969, 44/79463
Int. Cl. H01j *31/50*
U.S. Cl. 250—213 VT **5 Claims**



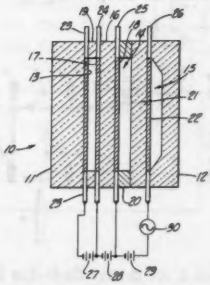
A system for continuously varying the size of the field of an X-ray image intensifier tube, wherein the voltages impressed on the electrodes of the tube are so controlled that the size of the field of view of the tube changes in such a manner that each and every point of the output image of the tube moves at a substantially constant speed.

3,675,028

IMAGE INTENSIFIER WITH ELECTROLUMINESCENT PHOSPHOR

John M. Grant, Granada Hills, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Aug. 13, 1969, Ser. No. 849,682
Int. Cl. H01j *31/50*
U.S. Cl. 250—213 VT **8 Claims**

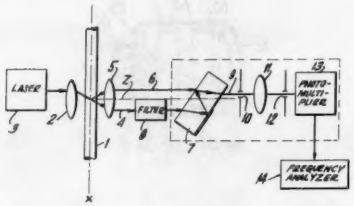


The subject dealt with herein concerns an intensifier tube which utilizes a channel-type electron multiplier. It is conventional to direct the output of such a multiplier onto an aluminized phosphor screen. However, poor resolution and aluminum layer damage results. According to this disclosure, a plate is provided having electroluminescent phosphor. An AC voltage is then applied between the multiplier and across the phosphor. Resolution is thereby improved and no screen damage results.

3,675,029
METHODS AND MEANS FOR MEASURING THE VELOCITIES OF LOCALIZED PORTIONS OF FLOWING MEDIA

Paul Dominik Iten, Oberrohrdorf, and Francois Mottier, Zurich, both of Switzerland, assignors to Brown Boveri & Company Limited, Baden, Switzerland

Filed April 22, 1971, Ser. No. 136,385
Claims priority, application Switzerland, April 27, 1970, 6247/70
Int. Cl. G01n *21/26*
U.S. Cl. 250—218 7 Claims

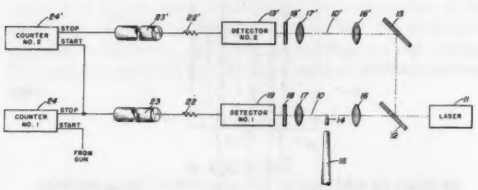


The velocity of a localized portion of a fluid medium is measured by focusing a laser beam onto the point to be measured, and then, with a single lens focused on the point, transforming the resulting scattered light as well as the unscattered light into beams parallel to the axis of the lens. The back face of a plate angularly oriented to the axis of the lens reflects one of the beams toward the intersection of an other beam with the front face of the plate. The front face is a half mirror which passes the oncoming other beam and again reflects the already reflected beam. This superimposes the two beams. The composite beam is then detected by a photodetector. Suitable means indicate the resulting heterodyne frequency as a measure of the velocity of the medium.

3,675,030
FAST LASER PROJECTILE DETECTION SYSTEM

Martin Tanenhaus, Suitland, Md., assignor to The United States of America as represented by the Secretary of the Navy

Filed Jan. 25, 1971, Ser. No. 109,269
Int. Cl. G01p *3/68*
U.S. Cl. 250—222 R 5 Claims

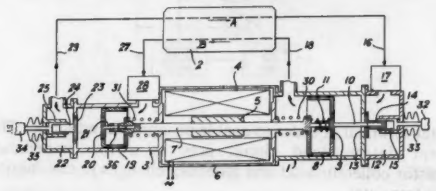


The present invention is directed to an improvement in a system for measuring the ejection time and muzzle velocity of a gun. The measurement system utilizes a laser whose beam is split and then directed across the projectile ejection path to two photodetectors. When the gun is triggered, a projectile is fired and successively breaks the light paths between the laser beams and their associated photodetectors. The improvement comprises the use of analog and digital integrated circuit components in the detector portion of the measuring system. An analog device, a differential video amplifier, and a digital device, a differential dual line receiver, are combined with a photodetector and current amplifier to form the improved detector circuit.

3,675,031
HEAT-TO-ELECTRIC POWER CONVERTER

Pierre Lavigne, Grenoble, France, assignor to Commissariat A L'Energie Atomique, Paris, France

Filed Nov. 18, 1970, Ser. No. 90,645
Claims priority, application France, Nov. 27, 1969, 6940996
Int. Cl. H02k *35/02*
U.S. Cl. 290—1 2 Claims

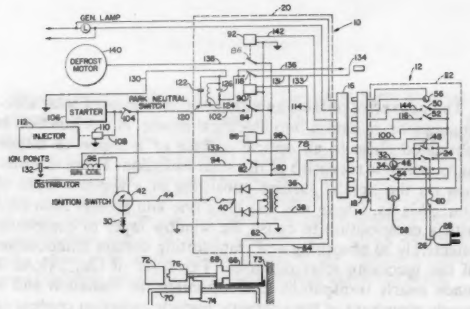


The converter comprises a linear alternator consisting of a stationary armature and a field winding which is capable of linear reciprocating motion within the armature. A fluid is circulated within a closed loop system so as to operate a driving machine constituted by an expansion section and a compression section each containing a piston directly connected to the field winding for carrying out the reciprocating motion and causing simultaneous expansion and compression of the fluid within the two sections. The hot fluid which is discharged from the expansion section and the cold fluid which is discharged from the compression section are circulated in two circuits in opposite directions within a heat exchanger and then fed back respectively into the compression section and the expansion section.

3,675,032
REMOTE VEHICLE STARTING SYSTEM

John Shaheen, Roslindale, Mass.

Filed May 11, 1970, Ser. No. 36,272
Int. Cl. F02n *11/08*
U.S. Cl. 290—38 C 4 Claims

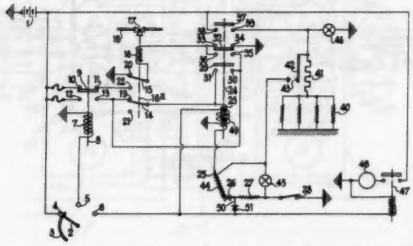


A relay unit is mounted in the vehicle and connected to the vehicle's electrical system. A detachable cable connects the relay unit to a control unit located in the house or other remote location. From the remote location, the system may be set to apply a charge to the vehicle's battery, then to start the vehicle's engine and operate the heater control so that the engine and the compartment will be warm and ready to be driven when the operator goes out to drive the vehicle.

3,675,033
DEVICE FOR STARTING AND STOPPING A DIESEL ENGINE

Gilbert Richard, Giromagny, and Gerard Moronval, La Garenne, both of France, assignors to Automobiles Peugeot, Paris and Regie Nationale Des Usines Renault, Billancourt, France

Filed Oct. 23, 1970, Ser. No. 83,502
Claims priority, application France, Jan. 7, 1970, 7000360; March 31, 1969, 6909616
Int. Cl. F02n *11/00*
U.S. Cl. 290—38 **12 Claims**

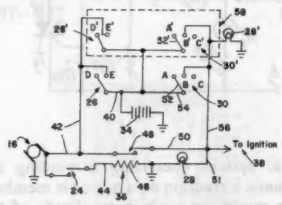


Device for starting and stopping a combustion engine of the Diesel type comprising a three-position switch having a stable position in which the heater plug circuit and the engine starter circuit are open, a second stable position in which, assuming that the engine is insufficiently warm, the heater plug circuit is closed, the starter circuit remaining open, and an unstable position in which the starter circuit is closed. Means are provided to indicate to the driver when the switch can be placed in the unstable position. The heater plug circuit is automatically opened at the end of a given period of time which depends on the surrounding temperature irrespective of whether the user has or has not placed the switch in the unstable position and actuated the engine starter.

3,675,034
BLOCKING CIRCUIT FOR INBOARD ENGINE IGNITION

George W. Abplanalp, Belmont, and Steve Corson, Luther, both of Mich.

Filed July 6, 1971, Ser. No. 159,666
Int. Cl. H02j *1/00*
U.S. Cl. 307—9 **6 Claims**

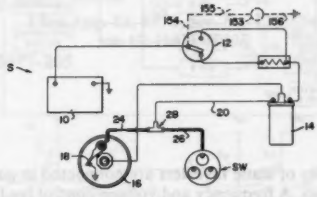


A blocking circuit is provided in combination with an inboard motorboat engine, blower, and ignition circuit which prevents actuation of the ignition circuit until after the blower has operated for a predetermined period of time to ventilate the engine compartment. A time-delay switch is operated by a blower-activated switch in circuit with the ignition circuit. Upon actuation of the blower, the blower-activated switch closes energizing the time-delay switch. After a predetermined time interval, the time-delay switch closes and completes the ignition circuit whereupon the craft may be started and operated in a conventional manner. An emergency ignition switch is also provided in parallel with the blocking circuit to allow operation of the engine in the event of an emergency. Use of the emergency switch renders it inoperative requiring that it be replaced after such use to prevent indiscriminate subsequent use by an unconscionable operator.

3,675,035
THEFT-PROOF AUTOMOBILE IGNITION SYSTEM

Joseph Brasty, Maple Heights, Ohio

Filed Jan. 25, 1971, Ser. No. 109,513
Int. Cl. H02g *3/00*
U.S. Cl. 307—10 AT **11 Claims**

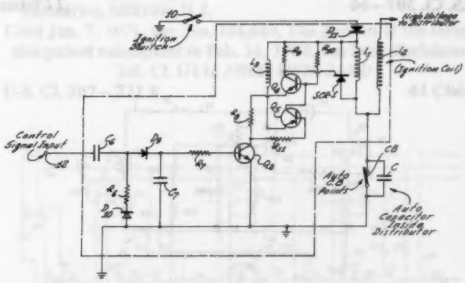


The theft-proof ignition system comprises a special multi-element control switch connected between the primary of an ignition coil and the breaker circuit of a distributor whereby the auto cannot be started until the special switch is closed. Shielding provided on the leads prevents any possible shorting out of the control switch. Means also may be provided to render the control switch inoperative automatically when the driver's door of the automobile is open. The shielded leads have a connection or coupling member therein.

3,675,036
AUTO THEFT PREVENTION SYSTEM

Ronald C. Davies, Las Vegas, Nev., assignor to Modern Research Inc., Las Vegas, Nev.

Filed April 9, 1970, Ser. No. 27,018
Int. Cl. B60r *25/04*
U.S. Cl. 307—10 AT **9 Claims**

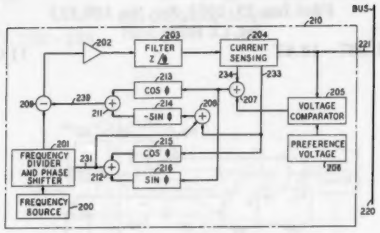


An improved anti-theft system for a motor vehicle, or the like, which effectively prevents any voltage from being built up across the ignition coil of the vehicle unless a control signal is applied to the system. This is achieved by including a silicon controlled rectifier, for example, in the circuit, the silicon controlled rectifier being fired whenever attempts are made to start the vehicle without the introduction of the control signal to the ignition circuit, the silicon controlled rectifier effectively short-circuiting the primary of the ignition coil as to prevent any build-up of ignition voltage across the secondary. An improved electronic lock circuit supplies the required control signal to the anti-theft system only when a series of switches are closed in a particular pre-selected sequence known only to the owner of the vehicle.

3,675,037
TECHNIQUE FOR SYNCHRONOUS PARALLEL OPERATION OF STATIC INVERTERS

Billy Harold Hamilton, Summit, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 1, 1971, Ser. No. 148,681
Int. Cl. H02j 3/38
U.S. Cl. 307—51 10 Claims

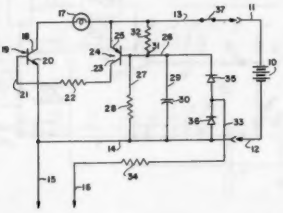


A plurality of static inverters are connected in parallel to a common bus. A frequency and voltage control feedback loop in each inverter encompasses the load terminals and permits the inverter to operate independently with only its output terminals common to the rest of the system. The inverter output is harmonized with the common signal on the bus by achieving orthogonality between the real and reactive output currents and the voltage and frequency, respectively, of the common signal on the bus. The orthogonality is obtained by applying appropriate voltage magnitude and phase correction signals to the internal voltage generating mechanism of each individual inverter. This permits the utilization of the inverters in parallel without the necessity of using some common reference frequency signal source and hence improves reliability of the system.

3,675,038
AUXILIARY LIGHTING SYSTEM

H. Daniel Dyer, III, Georgetown, Conn.

Filed Oct. 23, 1970, Ser. No. 83,273
Int. Cl. H02j 7/00
U.S. Cl. 307—66 2 Claims

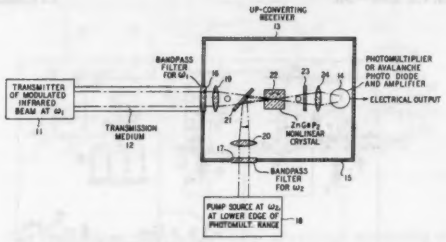


An auxiliary electric lighting system is described which comprises plug means for insertion into an outlet of a public utility circuit, circuitry connected electrically to the plug means, an independent source of power connectable into said circuitry, a filament light source also in the circuitry which is illuminated by said independent source of power when the auxiliary system is in operation. The device also includes a bistable, transistorized, automatically reversible circuit portion which includes said light source. The auxiliary lighting system is inoperative during normal power supply to the outlet and operative only upon failure of such normal power supply.

3,675,039
COHERENT OPTICAL DEVICES EMPLOYING ZINC GERMANIUM PHOSPHIDE

Gary Delane Boyd, Rumson; Ernest Buehler, Chatham, and William Bentley Gandrud, Madison, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 9, 1971, Ser. No. 113,913
Int. Cl. H03f 7/00; H04b 9/00
U.S. Cl. 307—88.3 11 Claims

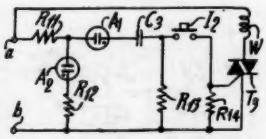


An upconverting receiver for modulated radiation at a carrier wavelength of 10.6 micrometers and a tunable parametric oscillator operating in the infrared portion of the spectrum are disclosed, in each of which a zinc germanium phosphide ($ZnGeP_2$) crystal is employed as the interaction medium and is pumped by a laser operating substantially at 1.06 micrometers in the infrared in a direction substantially normal to the optic axis. This crystal is presently unique in providing phase matching nearly normal to the optic axis for sum frequency upconversion from a signal wavelength of 10.6 micrometers.

3,675,040
ELECTROMAGNETIC SYSTEM CONTROLLING A MOVABLE MEMBER THROUGH THE AGENCY OF A MAGNETIC FIELD

Harald Stampfli, Petit-Saconnex, Switzerland, assignor to Lucifer S.A., Carouge-Geneva, Switzerland

Filed May 5, 1970, Ser. No. 34,762
Int. Cl. H01h 9/56
U.S. Cl. 307—133 3 Claims

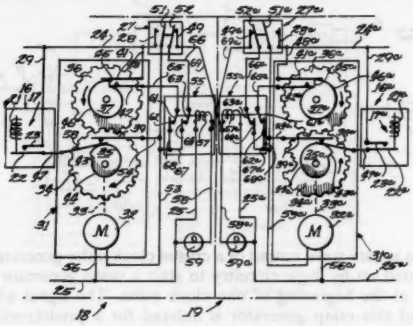


An electronic system energizing a winding adapted to produce a magnetic attraction on a movable member. In order to produce the maximum peak in amplitude of the current energizing the winding, which peak is obtained when the A.C. voltage feeding the winding passes through zero, an electronic switch is inserted between the A.C. supply and the winding to be energized, said switch becoming conductive at the moment of the reversal of current at this zero voltage. Said switch is constituted advantageously by a semi-conductor rectifier such as a SCR or thyristor associated with a diode which is rendered conductive just before the passage of the A.C. voltage through zero so as to allow current to pass through the SCR as soon as it is reversed. Other embodiments resort to a triac which is released at the actual moment of current reversal.

3,675,041
REGENERATION CONTROL AND TIMER SYSTEM

Eugene R. Elliott, and Lehner C. Freborg, both of Libertyville, Ill., assignors to Culligan International Company, Northbrook, Ill.

Filed Dec. 28, 1970, Ser. No. 101,601
Int. Cl. H01h *43/00*
U.S. Cl. 307—141 14 Claims

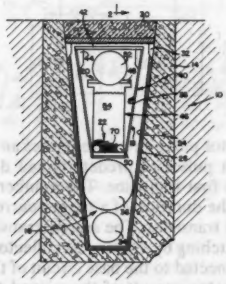


A regeneration control and timer system for one or two water softening or conditioning units to provide for regeneration of the softening material when it has become exhausted, with each water softening unit containing a sensor for indicating the stage of exhaustion of the material and actuating a timer for initiating a regeneration cycle. A timer clock is also present for utilization if the sensor is inoperable and the control contains a shiftable lever and a switch to change from sensor to clock operation. Also, the control system provides for duplexing of the timers and sensors of two water softeners using only a pair of connecting wires so that only one of the two softeners will be regenerated at a time even though both softeners reach the point of exhaustion at substantially the same time.

3,675,042
APPARATUS FOR POWER TRANSMISSION UTILIZING SUPERCONDUCTIVE ELEMENTS

Marshall F. Merriam, Berkeley, Calif., assignor to Gulf Oil Corporation, San Diego, Calif.

Continuation of Ser. No. 703,582, Feb. 7, 1968. This application March 13, 1970, Ser. No. 18,385
Int. Cl. H01b *7/34*; H02g *9/06*
U.S. Cl. 307—147 3 Claims

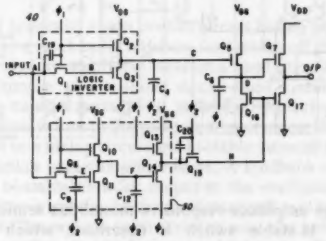


An electrical power transmission line utilizing superconductivity is provided in which each conductor includes a superconductive portion and a normally conductive portion having high thermal conductivity with the two portions being in electrical and thermal contact along substantially their entire lengths. The conductors are in the shape of thin wires to provide a low magnetic field and permit high current densities. The conductors are connected in pairs into a plurality of direct current circuits which in turn are connected to one another in parallel and are arranged in a plurality of circular clusters to further minimize the magnetic field and which may be selectively connected between a power source and one or more loads.

3,675,043
HIGH SPEED DYNAMIC BUFFER

Anthony Geoffrey Bell, 6718 De Moss 069, Houston, Harris County, Tex.

Filed Aug. 13, 1971, Ser. No. 171,654
Int. Cl. H03k *19/08*
U.S. Cl. 307—205 18 Claims

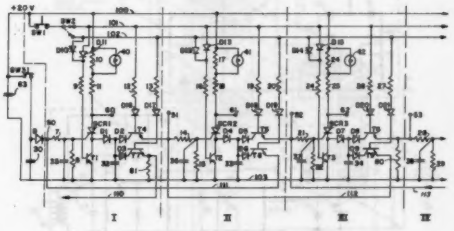


Disclosed is a high speed insulated gate field effect transistor output buffer circuit integrated on a monolithic clip utilizing novel voltage drive circuitry. The circuit combines high speed with low operating voltages to provide a bipolar TTL compatible circuit.

3,675,044
SILICON CONTROLLED RECTIFIER FORWARD AND REVERSE SHIFT REGISTER

Walter H. Vogelsberg, Carversville, Pa., assignor to Wheaton Industries, Millville, N.J.

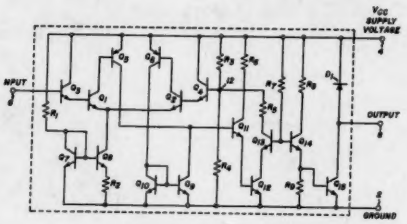
Filed Jan. 7, 1971, Ser. No. 104,643. The portion of the term of this patent subsequent to Feb. 16, 1988, has been disclaimed.
Int. Cl. G11c *19/00*; H03k *21/00*
U.S. Cl. 307—221 B 41 Claims



A silicon controlled shift register capable of shifting in a forward or reverse direction and shifter circuits for controlling the register are disclosed. The shift register is made up of a plurality of identical stages. Each stage comprises an input circuit, one silicon controlled rectifier, signal storage means, signal output means, a forward signal transfer means, and a reverse signal transfer means. The register can be operated as a serial register with a single input and a single output or it can be operated in a ring fashion or a plurality of inputs and out-

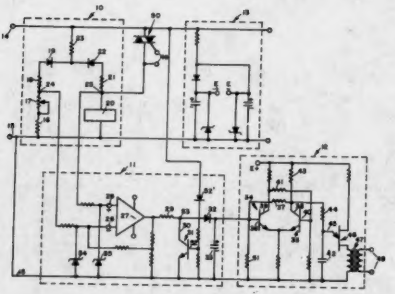
puts can be provided. The register is particularly adaptable to machine control and to the control of industrial processes. Several different shifter circuits and a special input circuit are disclosed. The shifter circuits range from mechanical switching circuits to electro-mechanical switching circuits.

3,675,045
VOLTAGE RESPONSIVE SWITCH
Jerome R. Mullaly, Liverpool, N.Y., assignor to General Electric Company
Filed Feb. 4, 1971, Ser. No. 112,685
Int. Cl. H03k *5/20, 3/26*
U.S. Cl. 307—235 **5 Claims**



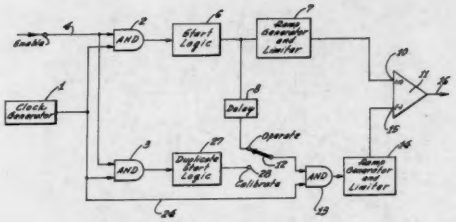
A voltage amplitude-responsive monolithic semiconductor integrated bi-stable switch is described, which switches responsive to level of input voltage relative to an internally generated reference potential, and is operable over a wide range of supply voltages and ambient temperatures with high gain regenerative switching action and predetermined hysteresis.

3,675,046
CONTROL CIRCUIT
Robert J. Harkenrider, and John L. Moe, both of Winona, Mich., assignors to Waynco, Inc., Winona, Minn.
Filed Sept. 28, 1970, Ser. No. 76,086
Int. Cl. H03k *17/00*
U.S. Cl. 307—252 B **10 Claims**



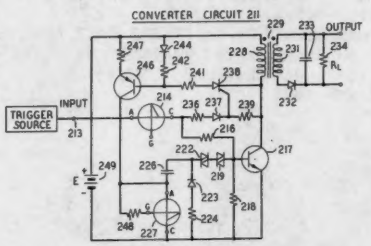
A circuit is provided in which an electrically conductive load being controlled is in one leg of a bridge with the load also acting as its own transducer. When power to the load is off, energy pulses are applied to the bridge to compare the operating condition of the load to the balance setting of the bridge. An unbalanced condition in the bridge is then used to initiate control action.

3,675,047
PRECISION PULSE GENERATOR
Richard E. Vahlstrom, Villa Park; Donald C. Nutten, Newport Beach, and Dennis R. Bayne, Placentia, all of Calif., assignors to Northrop Corporation, Los Angeles, Calif.
Filed June 7, 1971, Ser. No. 150,376
Int. Cl. H03k *5/00, 5/04*
U.S. Cl. 307—260 **6 Claims**



The square wave output of a crystal clock pulse generator is operated on by logic circuitry to start a ramp generator exactly at the beginning of one clock pulse. The signal which started this ramp generator is delayed for a predetermined time and then used to start an identical ramp generator exactly at the beginning of a later clock pulse. Outputs of the ramp generators are fed respectively to the opposite-polarity inputs of a difference amplifier, so that the amplifier output is a pulse started by the first ramp generator and stopped by starting of the second ramp generator, and the output pulse width is a precise multiple of the clock pulse period. Calibrating circuitry, when actuated, bypasses the delay function and allows comparison of the two ramp generator outputs simultaneously. If they are equal as they should be, the output of the difference amplifier is a straight line.

3,675,048
PULSE CIRCUIT FOR CONTROLLING PULSE DURATION
Osman Metin Yenisey, Rockaway, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed June 28, 1971, Ser. No. 157,411
Int. Cl. H03k *5/04, 5/13, 3/284*
U.S. Cl. 307—261 **7 Claims**

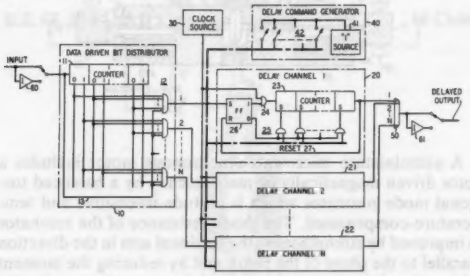


A two-transistor pulse circuit generates an output pulse or a series of output pulses of predetermined duration from the collector of the first transistor. The number of output pulses depends upon the duration of a trigger current applied to the base of the first transistor. The second transistor aids the first transistor in switching by drawing its collector current through a capacitor connected to the base circuit of the first transistor. When the collector current of the second transistor charges the capacitor to a predetermined level, a voltage-sensitive switch discharges the capacitor through the first transistor to turn it off and end the output pulse. A modified version of the circuit is used to generate an output pulse with an energy content independent of power supply voltage variations.

3,675,049
VARIABLE DIGITAL DELAY USING MULTIPLE PARALLEL CHANNELS AND A SIGNAL-DRIVEN BIT DISTRIBUTOR

Roger Lindsy Haven, North Kingstown, R.I., assignor to Western Electric Company, Incorporated, New York, N.Y.

Filed April 24, 1970, Ser. No. 31,689
Int. Cl. H03k 17/26
U.S. Cl. 307—293 11 Claims

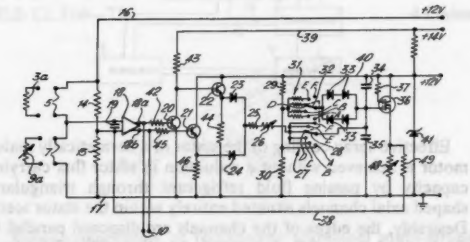


A device for delaying the bits of a serial data stream particularly suitable for producing a variable delay for a large number of bit times. Bits of the incoming data stream are sequentially applied to the inputs of a number of parallel delay channels by a bit distributor. The outputs of all the delay channels are logically "OR"ed together to reform the data stream. The distributor advances only after a "one" has been applied to a delay channel; therefore, fewer data channels are necessary than the number which corresponds to the maximum delay produced by the system.

3,675,050
CONTROL CIRCUITS FOR USE IN AUTOMATIC CONTROL SYSTEMS

Ian Andrew Paul, Bishopbriggs, Scotland, assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jan. 14, 1971, Ser. No. 106,521
Claims priority, application Great Britain, Jan. 16, 1970, 2,335/70
Int. Cl. H03k 3/26
U.S. Cl. 307—304 14 Claims

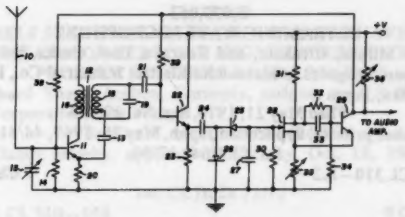


A controller for use in a control system is provided having an internal electronic feedback loop to approximate proportional plus integral control. The approximation is achieved through the charging and discharging of a capacitor located in the electronic feedback loop. An actuator is driven during the charging cycles of the capacitor.

3,675,051
HAND PROXIMITY ALARM CONTROL CIRCUIT

George T. Mioduski, Houston, Tex., assignor to General Electric Company

Filed June 24, 1970, Ser. No. 49,448
Int. Cl. H03k 17/00
U.S. Cl. 307—308 7 Claims

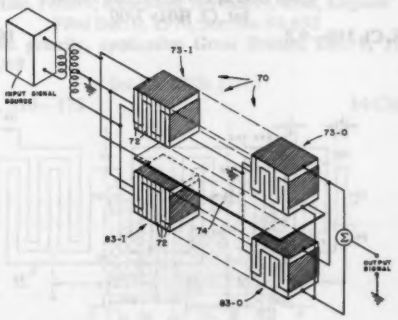


A hand proximity alarm control circuit having principal application to a clock radio receiver, for turning off the radio for a brief period by simply the wave of a hand once it has come on in response to an alarm signal. Said circuit operates through a capacitive coupling, provided by placing the hand or other object close to the radio, to trigger an oscillator which is coupled to a timing circuit and bi-stable network for inhibiting the radio's audio amplifier stage. A feedback connection from the bi-stable network output to the oscillator input inhibits further triggering of the oscillator until said brief period has ended. The present control circuit may also have use with other forms of electronic devices in addition to radio receivers for temporarily modifying their operation.

3,675,052
FIELD-DELINEATED ACOUSTIC WAVE DEVICE

George F. Lindsay, Los Angeles, and Harper John Whitehouse, Hacienda Heights, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy

Filed Aug. 7, 1970, Ser. No. 62,117
Int. Cl. H01v 7/00
U.S. Cl. 310—8.1 10 Claims



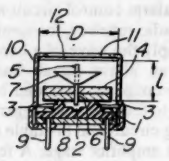
An acoustic wave device, wherein an applied electrical signal is transduced to an acoustic wave, comprising: a substrate capable of propagating the acoustic wave; a conductive structure disposed upon the substrate, including at least three separate conductive paths; a pair of the conductive paths including spaced-apart electrodes; and the third conductive path including field-delineating electrodes which are disposed between the electrodes of the pair of paths. In more detail, each of the conductive paths of the acoustic wave device include electrodes in the form of parallel elements, linear or

planar, disposed upon the substrate perpendicularly to the direction of surface wave propagation, caused by the application of an electrical voltage to the pair of conductive paths, which is transduced to an acoustic surface wave. The electrodes of each conductive path are spaced a distance *nd* apart, where *n* is an integer, *n* being equal to 1 for the spacing of the shielding electrodes. A bus at one end of the elements connects the set of elements of each respective conductive path.

3,675,053
ULTRASONIC WAVE MICROPHONE

Hideo Mifune, Hirakata, and Kenroku Tani, Osaka, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 21, 1970, Ser. No. 39,214
Claims priority, application Japan, May 26, 1969, 44/41224
Int. Cl. H04r *17/00*
U.S. Cl. 310—8.2 **7 Claims**

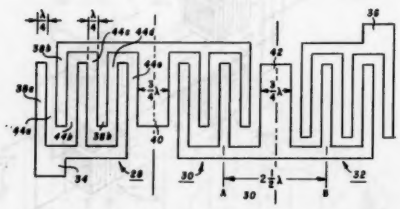


An ultrasonic wave microphone which comprises a flat piezo-electric vibrator and a funnel-like appendant resonator formed of a metal having a high Q and connected to the piezo-electric vibrator at the center thereof so that electrical characteristics of the microphone can be varied, and which is especially useful for a remote control device or the like for a television set.

3,675,054
SERIES CONNECTION OF INTERDIGITATED SURFACE WAVE TRANSDUCERS

William Stanley Jones, Richardson, and Clinton S. Hartmann, Dallas, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 2, 1970, Ser. No. 94,305
Int. Cl. H01v *7/00*
U.S. Cl. 310—9.8 **16 Claims**

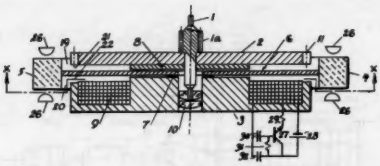


In a transducer in which a plurality of acoustic sections are cascaded in series, a plurality of electrical sections are also cascaded in series to produce a relatively long interdigitated surface wave transducer having a relatively large input impedance. In one embodiment, electrical cascading is effected so that the interconnected acoustic sections are in phase with each other. In a different embodiment the series electrical cascading produces a phase reversal between the interconnected acoustic sections.

3,675,055
MOTOR INCORPORATING TORSIONAL MODE RESONATOR

C. Hunter McShan, P.O. Box 392, Northport, N.Y.

Continuation-in-part of Ser. No. 888,435, Dec. 29, 1969. This application March 15, 1971, Ser. No. 124,178
Int. Cl. H02k *33/16*
U.S. Cl. 310—22 **33 Claims**

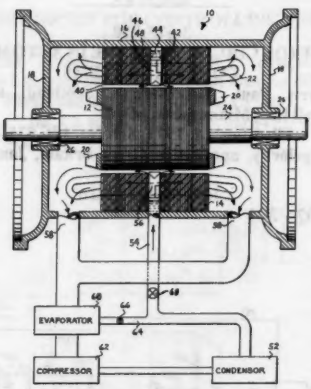


A subminiature microwatt synchronous motor includes a rotor driven magnetically or mechanically by a balanced torsional mode resonator which is attitude-insensitive and temperature-compensated. The shock resistance of the resonator is improved by strengthening the torsional arm in the direction parallel to the plane of the rotor, and by reducing the moment of inertia of the masses in the cantilever mode to raise the ratio of cantilever/torsional frequencies.

3,675,056
HERMETICALLY SEALED DYNAMOELECTRIC MACHINE

Henry George Lenz, Scotia, N.Y., assignor to General Electric Company

Filed Jan. 4, 1971, Ser. No. 103,497
Int. Cl. H02k *9/10*
U.S. Cl. 310—54 **9 Claims**



Effective spray cooling of the stator of a hermetically sealed motor is achieved without a reduction in stator flux carrying capacity by passing fluid refrigerant through triangularly shaped axial channels situated entirely within the stator teeth. Desirably, the edges of the channels are disposed parallel to the tapered faces of their associated teeth and the flux carrying area of each tooth is equal to the flux carrying area of the tooth face confronting the motor air gap. In one embodiment of the invention, entry of fluid refrigerant to the axial channels within the teeth is accomplished utilizing a diversely apertured annular manifold centrally positioned along the stator core and the refrigerant is withdrawn at both ends of the motor. Other refrigerant flow configurations, e.g., admitting the refrigerant at both ends of the motor and exhausting the

refrigerant at the center or both ends of the motor, also are described.

3,675,057

SUBMERSIBLE ELECTRIC MOTOR

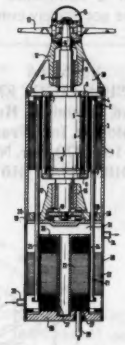
Friedrich-Wilhelm Pleuger, Hamburg, Germany, assignor to Pleuger Unterwasserpumpen GmbH, Hamburg, Germany

Filed Dec. 24, 1970, Ser. No. 101,204

Claims priority, application Germany, Dec. 30, 1969, P 19 65 543.7

Int. Cl. H02k *11/00*

U.S. Cl. 310—68 D **10 Claims**



In a submersible liquid filled motor transformer assembly the stator and rotor members of the motor have bar windings. The bar windings of the stator are directly connected to the bar shaped secondary windings of the transformer, the primary windings of which are enclosed in a fluidtight cartridge which is interchangeable for connection to mains of different voltages and frequencies and exposed to the liquid filling of the assembly which also contacts the bar windings of both motor members.

3,675,058

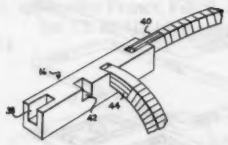
DYNAMOELECTRIC MACHINE UTILIZING PREFORMED WINDING CONNECTORS AND METHOD OF MAKING

Norman A. Beddows; John A. Quigley, both of Scotia, and Warren P. Wielt, Schenectady, all of N.Y., assignors to General Electric Company

Filed Sept. 8, 1970, Ser. No. 70,165

Int. Cl. H02k *11/00*

U.S. Cl. 310—71 **4 Claims**



Series connections of rectangular aluminum multi-strand coil leads of a dynamoelectric machine can be readily made in a confined space by the utilization of prefabricated aluminum connectors having apertures therein to snugly receive the uninsulated extremities of the coil leads being joined. In making the weld, the individual strands forming the coil leads initially are joined e.g., utilizing MIG-welding or other conventional joining techniques, whereafter the joined strands are welded to the connector side wall and the weld is finished with a concave aluminum button to maximize the reliability of the joint. A suitable electrical insulation then is applied over both the connector and the uninsulated extremities of the coil leads and the joined leads are mechanically secured to the motor end turns to reduce stress upon the joint during motor operation. Prefabricated connectors also are disclosed for joining the phase and/or series leads to the arcuately shaped ring conductor without canting the natural curvature of the conductors forming the connection.

3,675,059

SELF STARTING SYNCHRONOUS MOTOR HAVING MEANS FOR REDUCING NEGATIVE TORQUE TO PRODUCE STABLE NO-LOAD ROTATION

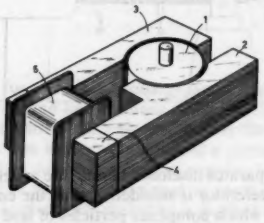
Richard Thees, Aachen, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 8, 1965, Ser. No. 494,066

Claims priority, application Germany, Oct. 15, 1964, N 25680

Int. Cl. H02k *21/12*

U.S. Cl. 310—156 **9 Claims**



A synchronous motor having a permanent magnet rotor of the type that is self-starting by vibration. A more stable no-load rotation of the motor is achieved by providing means for reducing the negative portions of the instantaneous torque produced by the motor. The above object is obtained in one embodiment of the invention by choosing the dimensions of the stator so that the stator iron is saturated under no-load conditions of the motor.

3,675,060

INDUCTION MOTORS

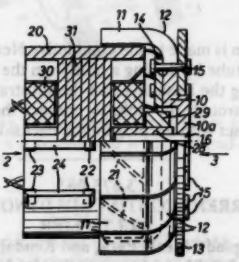
Brian Hills, Pentire, Knockholt, Sevenoaks, Kent, England

Filed Dec. 3, 1970, Ser. No. 94,692

Claims priority, application Great Britain, Dec. 9, 1969, 60,032/69

Int. Cl. H02k *17/10*

U.S. Cl. 310—172 **14 Claims**



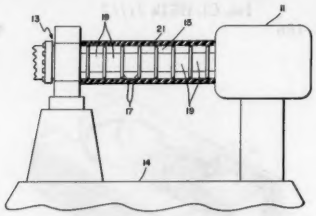
An induction motor having its rotor symmetrically outside its stator has the rotor formed of a cup-shaped ferromagnetic member, which has an annular array of fingers encircling the stator and projecting from a base which is axially beyond the stator, there being a squirrel cage conductor system disposed

solely at the base end of the rotor. The stator consists of a pole-forming ring with shading band sets and adjacent high reluctance paths and with internal energizing coils.

ERRATUM

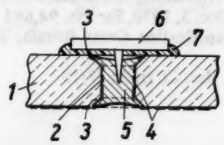
For Class 310—266 see:
Patent No. 3,675,102

3,675,061
SHIELDING FOR A PARTICLE ACCELERATOR
Stanley Harrison, Bedford, Mass., assignor to KEV Electronics Corporation, Wilmington, Mass.
Filed June 4, 1969, Ser. No. 830,274
Int. Cl. H05h *5/00*
U.S. Cl. 313—63 **3 Claims**



In the apparatus disclosed herein, the accelerating tube of a particle accelerator is shielded against the emission of X-rays by a shield which comprises particles of lead oxide supported in a semi-insulating rubber matrix.

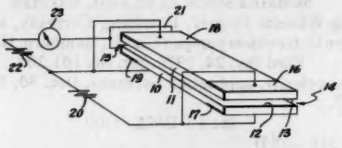
3,675,062
METHOD AND APPARATUS FOR CONNECTING TO A NESA LAYER
Gunter Flasche, Darmstadt, Germany, assignor to Fernseh GmbH, Darmstadt, Germany
Filed April 2, 1970, Ser. No. 25,192
Claims priority, application Germany, April 5, 1969, P 19 17 674.0
Int. Cl. H01j *31/26*
U.S. Cl. 313—65 **6 Claims**



Connection is made to the conductive Nesa layer of a television camera tube by drilling a hole from the backside of a substrate, putting the Nesa layer on the substrate, inserting an indium plug through the hole to contact the Nesa layer, and making contact with the plug on the backside.

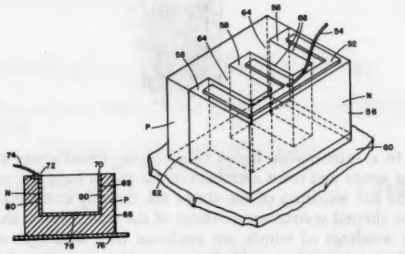
3,675,063
HIGH CURRENT CONTINUOUS DYNODE ELECTRON MULTIPLIER
Charles A. Spindt, Menlo Park, and Kendal T. Rogers, Los Altos, both of Calif., assignors to Stanford Research Institute, Menlo Park, Calif.
Filed Jan. 2, 1970, Ser. No. 360
Int. Cl. H01j *43/00*
U.S. Cl. 313—104 **1 Claim**

A continuous dynode electron multiplier for detecting and multiplying charge flow in a vacuum. Continuous dynodes are deposited on thermally conductive substrates. Heat sinks attached to the substrates permit operation of the multiplier at high current levels without the threat of thermal runaway.



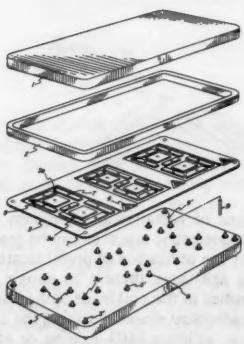
Further, the method of making the continuous dynodes includes depositing from a composite source, whereby the dynode resistance can be accurately controlled.

3,675,064
DIRECTED EMISSION LIGHT EMITTING DIODE
Michael G. Coleman, and Tommie R. Huffman, both of Tempe, Ariz., assignors to Motorola, Inc., Franklin Park, Ill.
Filed Feb. 16, 1970, Ser. No. 11,573
Int. Cl. H05b *33/02*; **H01z** *3/14*
U.S. Cl. 313—108 D **12 Claims**



Semiconductor light sources comprising PN junctions in which the PN junctions project the light they produce in a desired direction. This is accomplished by positioning one or more PN junctions in a plane parallel to the desired direction.

3,675,065
PLANAR GAS DISCHARGE INDICATOR
Leland C. Warne, Phoenix, Ariz., assignor to Sperry Rand Corporation
Filed Jan. 23, 1970, Ser. No. 5,435
Int. Cl. H01j *7/42*; **H01k** *1/60*; **H05b** *37/00*
U.S. Cl. 313—109.5 **6 Claims**



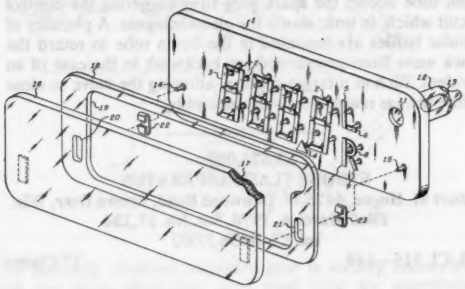
An alpha-numeric indicator of the planar gas tube variety wherein both the anode and cathode elements are planar sur-

faces supported in a common plane spacer from the supporting base of the assembly by electrical connections passing through the base.

3,675,066
PLANAR RAISED CATHODE ALPHA-NUMERIC GAS DISCHARGE INDICATOR

James B. Armstrong; Dan J. Schott, and Leland C. Warne, all of Phoenix, Ariz., assignors to Sperry Rand Corporation

Continuation-in-part of Ser. No. 742,662, July 5, 1968, abandoned. This application Sept. 4, 1970, Ser. No. 69,679
Int. Cl. H01j *61/66*
U.S. Cl. 313—109.5 **4 Claims**

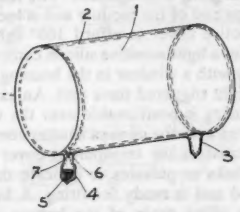


A gas discharge indicator comprising a cathode-supporting substrate and a parallel transparent anode spaced from and hermetically sealed to said substrate to contain an ionizable gas therebetween. Individual cathode segments having greater width than thickness are mounted on the tops of feed-through pins which penetrate the substrate in hermetically sealed relationship and extend beyond the opposite surfaces of the substrate whereby the individual cathode segments are spaced relative to the substrate as well as relative to the anode. The cathode-substrate spacing is such that the cathode segments glow only on the anode or viewable side of the cathode, thereby reducing the sputtering rate, and increasing the luminous efficiency. Additionally, a cup-shaped moat is formed in the cathode side of the substrate about each pin. The raised cathode and moat structure collectively and individually minimize the effects of sputtering and extend the operating life of the indicator.

3,675,067
OPTICAL RESONANCE CELL WITH MEANS FOR REGULATING INTERNAL VAPOR PRESSURE

Henri Brun, Paris, France, assignor to CSF-Compagnie Generale de Telegraphite Sans Fil

Continuation of Ser. No. 796,236, Feb. 3, 1969, abandoned. This application March 16, 1971, Ser. No. 124,974
Claims priority, application France, Feb. 2, 1968, 68138532
Int. Cl. H01j *61/24*
U.S. Cl. 313—174 **7 Claims**

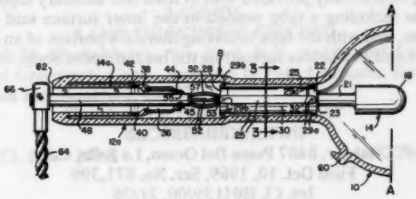


An optical resonance cell containing an alkali vapor to be optically pumped, the transparent walls of which are coated with a layer of paraffin while a bulb containing the reserve of alkali metal is connected to the cell in such a manner as to decelerate the alkali vapor flow between the bulb and the cell.

3,675,068
SEAL STRUCTURES FOR ELECTRIC DISCHARGE LAMPS

Herbert S. Strauss, Paramus, N.J., assignor to Duro-Test Corporation, Bergen, N.J.

Filed Sept. 10, 1970, Ser. No. 71,128
Int. Cl. H01j *5/50, 61/36*
U.S. Cl. 313—217 **9 Claims**

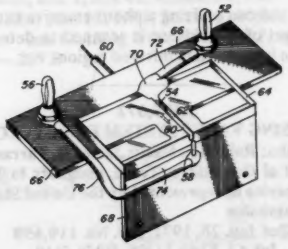


Seal structures for electrical discharge lamps which include a relatively massive rod-like member which carries the full lamp current and which has a portion within the lamp envelope for connection to the electrode and a portion outside of the lamp envelope to which a current-carrying lead is connected. The rod-like member is fastened to another member which in turn is hermetically sealed to a portion of the envelope to complete a seal which is capable of operating at high temperatures.

3,675,069
POINT LIGHT SOURCE

Kenneth R. Crossen, New York, N.Y., assignor to EG&G, Inc., Bedford, Mass.

Filed Jan. 6, 1971, Ser. No. 104,383
Int. Cl. H01j *1/88*
U.S. Cl. 313—268 **5 Claims**



A point light source is disclosed having a spark gap in which the arc is confined in a groove and is viewed end-on through an aperture in a mask.

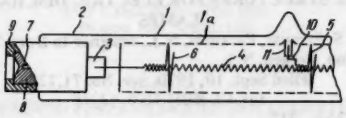
3,675,070
TUBULAR INCANDESCENT LAMP

Evgeny Fedorovich Prytkov, Bolshevistskaya ulitsa, 30, kv. 3, Saransk Mordovskoi, U.S.S.R.

Filed Sept. 30, 1970, Ser. No. 76,773
Int. Cl. H01j *1/94*; H01k *1/24*
U.S. Cl. 313—279 **2 Claims**

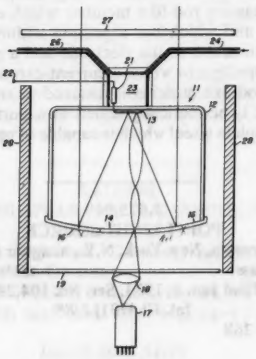
A tubular incandescent lamp adapted to be mounted for operation in positions other than horizontal comprising a

transparent envelope receiving thereinside a single-spiral incandescent body rigidly connected with a pair of electric leads sealingly secured in said envelope, and at least one holder supporting the incandescent body inside said envelope; the lamp



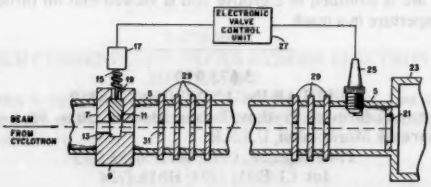
being additionally provided with at least one auxiliary support means including a tube welded to the inner surface said envelope, and with the tube receiving therein a portion of an adjacent one of a holder supporting the incandescent body.

3,675,071
INFRA-RED VIDICON
John P. Choisser, 8487 Paseo Del Ocaso, La Jolla, Calif.
Filed Oct. 10, 1969, Ser. No. 871,399
Int. Cl. H01j *39/00, 31/26*
U.S. Cl. 315—10 **2 Claims**



An infrared vidicon utilizing a photo-emissive cathode from which the target of the vidicon is scanned to detect infrared radiation in the intermediate infrared region.

3,675,072
FAST-CLOSING VALVE SYSTEM FOR CYCLOTRONS
Richard L. Hahn; Roland L. Stone; James R. Tarrant, and Lee D. Hunt, all of Oak Ridge, Tenn., assignors to The United States of America as represented by the United States Atomic Energy Commission
Filed Jan. 28, 1971, Ser. No. 110,690
Int. Cl. F16k *31/06;* **H05h** *7/10*
U.S. Cl. 315—111 **4 Claims**



A fast-closing valve system has been provided which operates to protect a cyclotron from loss of vacuum and backwash of radioactive contamination when using intensely alpha-active actinide targets. The valve portion consists of a valve chamber adapted for mounting in a beam tube and having aligned ports on opposite sides through which the accelerated particle beam travels. A valve gate is slidably mounted in the valve chamber between the ports and normally urged into a seated position, closing the ports, by means of compression springs. The valve gate is held open by means of an electromagnet and, when the current to the electromagnet is suddenly shorted, the magnetic field rapidly collapses and the springs slam the valve gate into the seated position. The circuit controlling the actuation of the electromagnet uses a spark plug as a pressure sensor mounted in the beam tube, downstream of the valve and when a slight pressure rise in the beam tube occurs the spark plug fires triggering the control circuit which, in turn, shorts the electromagnet. A plurality of annular baffles are mounted in the beam tube to retard the shock wave from pressurized gas backwash in the case of an accident, such as a target rupture, allowing the valve to close before the gas reaches the valve assembly.

3,675,073
STROBE FLASH APPARATUS
Robert M. Hogue, 4425 W. Dunwood Road, Brown Deer, Wis.
Filed March 6, 1970, Ser. No. 17,234
Int. Cl. H05b *37/02*
U.S. Cl. 315—149 **17 Claims**

Disclosed herein is a strobe flash apparatus with a modular construction in which the gas-filled flash tube and the circuit components are mounted on a printed circuit board to form a circuit module. The circuit module is mounted in a tubular housing with the camera sync-plug interfitting in a through aperture in the housing wall to anchor the circuit module against axial and angular displacement. The flash tube plugs into a socket at one end of the module and is located within a transparent protective cover to afford 360° light emanation. The circuit includes a light sensitive silicon controlled rectifier located in registry with a window in the housing to afford use of the flash as a light triggered slave unit. An axially shiftable sleeve on the housing is positionable over the window when the flash is triggered with the camera shutter contacts. A neon ready light is located in the transparent cover adjacent the flash tube and blinks or pulsates to indicate that the power pack has recycled and is ready for firing. A high resistance bridge minimizes idling drain of the battery in the power supply, and a high resistance and low current in the semi-conductor isolated trigger circuit minimizes burn of shutter contacts.

3,675,074

TRANSISTORIZED QUENCHING ARRANGEMENT FOR A DURATION-CONTROLLED FLASH TUBE

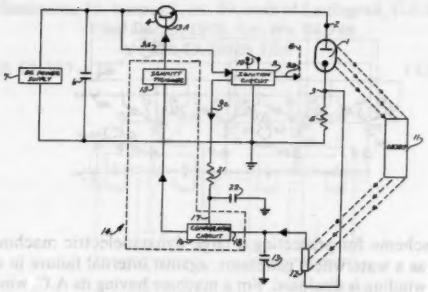
Rolf Dictor Dennewitz, Berlin, Germany, assignor to Loewe Opta GmbH, Berlin, Germany

Filed Aug. 6, 1970, Ser. No. 61,742

Claims priority, application Germany, Aug. 6, 1969, P 19 40 616.7

Int. Cl. H05b *41/38*

U.S. Cl. 315—159 4 Claims



A normally disabled transistor gate is serially connected with the main electrodes of a flash tube for selectively coupling operating voltage thereto. A reference voltage generated when an igniting pulse is applied to the tube is coupled to one input of a comparator circuit whose output excites a Schmitt trigger, thereby causing the trigger to generate a voltage of a first polarity. The trigger output voltage opens the gate to energize the main electrodes of the flash tube, thereby causing the tube to emit a flash of light. A portion of the light reflected from an object illuminated by the flash tube is detected by a photosensitive element and integrated to form a control signal, which is coupled to a second input of the comparator circuit. After a lapse of time sufficient to permit the control voltage to exceed the reference voltage, the comparator output reverses the state of the output voltage from the Schmitt trigger to disable the gate and terminate the flash.

3,675,075

AN ENERGY RESPONSIVE IMAGE CONVERSION AND AMPLIFICATION DEVICE

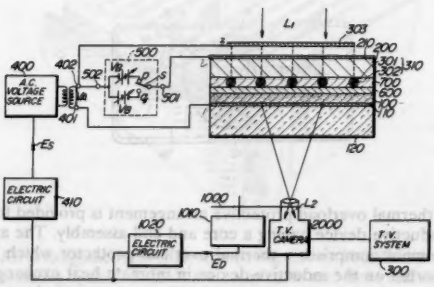
Tadao Kohashi, Yokohama, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Sept. 6, 1968, Ser. No. 758,057

Claims priority, application Japan, Sept. 11, 1967, 42/58897

Int. Cl. H05b *33/02, 37/00*

U.S. Cl. 315—169 9 Claims



A solid-state electroluminescent image display device which produces the output thereof in response to an image of the light, X-ray or other types of energy projected on to said device, said output being able to be controlled by varying a DC bias voltage for said device, and which comprises an electroluminescent layer excited by an AC electric field and controllable by a DC field and an energy-responsive layer whose resistivity varies in response to the incident energy such as a photoconductive layer, said two layers being interposed between a first light-pervious electrode and a second electrode in such a manner that the electroduminescent layer is adjacent to said first electrode, a third or composite electrode place between said two layers, the AC exciting voltage being connected between said first and third electrodes and the DC bias voltage between said second and third electrodes.

3,675,076

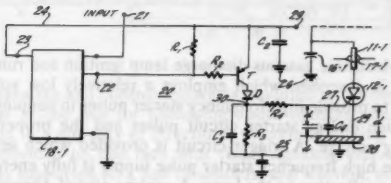
LAMP TRIGGERING CIRCUIT

Joseph M. Klockenbrink, New York, N.Y., and Kemal Aydin, Old Greenwich, Conn., assignors to Path Computer Equipment Inc., Stamford, Conn.

Filed June 12, 1970, Ser. No. 45,607

Int. Cl. H05b *41/34*

U.S. Cl. 315—200 R 11 Claims



Lamp triggering circuits for use in triggering selected lamps within a plural lamp array in a high-speed fashion and having circuit connection means adapted to prevent false triggering of lamps adjacent to those selected to fire.

3,675,077

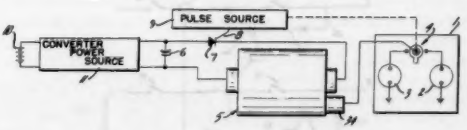
HIGH VOLTAGE IGNITION SYSTEM TRANSFORMER

Floyd M. Minks, Rte. 1, Box 41, Kissimmee, Fla.

Filed Jan. 18, 1971, Ser. No. 107,051

Int. Cl. H01g *9/00*; H01t *15/02*

U.S. Cl. 315—209 R 17 Claims



A pulse transformer connects a capacitor to an ignition means.

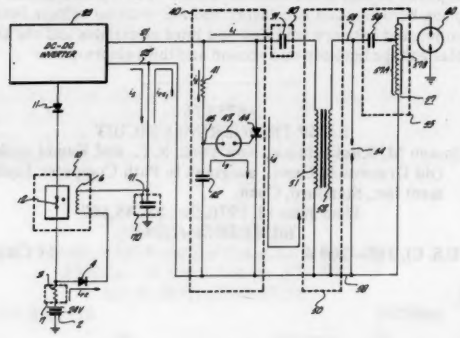
A secondary coil housing is a tubular shaped member molded about a core leg carrying a flat wound primary coil. An axially extended coaxial recess receives a multi-turn single layer secondary coil wound on a support tube. The recess is filled with a suitable potting material and a U-shaped core assembly is secured to the center core leg to define a closed rectangular path.

A high voltage connector is connected to the innermost turn of the secondary coil with a minimum spacing therebetween.

3,675,078
ELECTRONIC LAMP DRIVING CIRCUIT FOR HAND HELD LAMP

Stanley P. Levy, Oaklyn, N.J., assignor to Pichel Industries, Inc., Los Angeles, Calif.

Filed May 8, 1969, Ser. No. 822,962
Int. Cl. H05b 41/26
U.S. Cl. 315—289 13 Claims

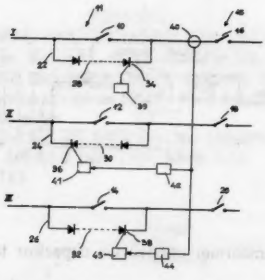


An electronic gaseous discharge lamp ignition and running circuit is described which employs a relatively low voltage supply to provide high frequency starter pulses in conjunction with high energy starter circuit pulses and the proper low running voltage. A trigger circuit is provided which assures that the high frequency starter pulse supply is fully energized before application to the lamp. A sensing circuit disconnects the ignition circuit from the low voltage supply once the lamp has started.

3,675,079
THREE PHASE ELECTRIC SWITCHING SYSTEM HAVING RECTIFIER SHUNTED CONTACTS

Louis Labbaye, Grenoble, and Georges Bernard, Saint Egreve, both of France, assignors to Merlin Gerin, Societe Anonyme, Grenoble, France

Filed June 28, 1971, Ser. No. 157,464
Claims priority, application France, July 15, 1970, 7026086
Int. Cl. H02h 7/22
U.S. Cl. 317—11 A 6 Claims

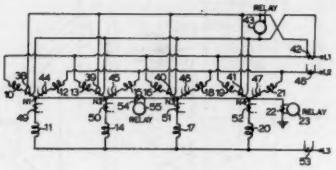


A medium or high voltage three phase electric switching system comprising in each phase a pair of separable contacts shunted by a plurality of serially connected rectifiers. A special connection of the rectifiers of the different phases and a gated trigger circuit permit to select the number of serially connected rectifiers of two of the phases corresponding to only a fraction of the circuit interphase reverse restriking voltage.

3,675,080
LARGE GENERATOR PROTECTIVE RELAYING SCHEME

Duncan Thomas Bath, Peterborough, Ontario, Canada, assignor to Canadian General Electric Company Limited, Toronto, Ontario, Canada

Filed Sept. 21, 1971, Ser. No. 182,358
Claims priority, application Canada, Feb. 24, 1971, 106,117
Int. Cl. H02h 7/06
U.S. Cl. 317—13 R 9 Claims

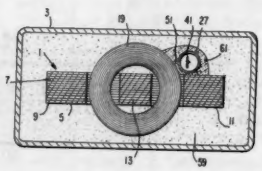


A scheme for protecting a large dynamoelectric machine, such as a waterwheel generator, against internal failure in an A.C. winding is disclosed. For a machine having its A.C. winding formed in at least two three phase star-connected circuits, the neutrals of each being connected generally together and to ground and the free ends of corresponding phases of each being connected together and to line terminals, a preferred form of the scheme consists of a first current transformer connected between one pair of neutrals. When this transformer senses an inter-neutral current above the normal value of inter-neutral current, a relay connected across it is actuated to initiate disconnecting the machine. Another current transformer may be connected between the neutrals and ground which similarly operates another relay upon sensing a substantial current flowing through it. Further current transformers are placed in each phase of the circuits. The outputs of those in corresponding phases are connected in parallel and differentially across the output of the current transformer in the respective line. A further relay is connected across this parallel arrangement to initiate disconnecting the machine when there is a flow of current through it.

3,675,081
THERMAL-OVERLOAD PROTECTIVE ARRANGEMENT FOR INDUCTIVE DEVICES

Mason H. Earing, Danville, Ill., assignor to General Electric Company

Continuation of Ser. No. 669,233, Sept. 20, 1967, abandoned. This application April 27, 1970, Ser. No. 29,768
Int. Cl. H02h 7/14
U.S. Cl. 317—15 18 Claims



A thermal overload protective arrangement is provided for an inductive device having a core and coil assembly. The arrangement comprises a thermal overload protector which is supported on the inductive device in intimate heat exchange relation with the coil by means of a thermally conducting adhesive. A thermally insulating coating is then deposited on the surface of the thermal overload protector, remote from the coil, to prevent heat from the coil from being dissipated away

before it reaches the thermal overload protector, thereby increasing the sensitivity of the device. The thermally insulating coating also serves to protect the thermal overload protector from an asphaltic potting composition which is poured, while hot, to enclose the entire inductive device.

3,675,082

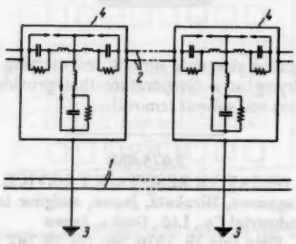
DIRECT-CURRENT POWER TRANSMISSION LINE

Semen Solomonovich Klyamkin, prospekt M. Toreza, 38, korpus I, kv. 64, and Jury Solomonovich Kraichik, prospekt Smirnova, 16, korpus 2, kv. 39, both of Leningrad, U.S.S.R.

Filed Dec. 3, 1970, Ser. No. 94,746

Int. Cl. H02h *3/20*

U.S. Cl. 317—20 **1 Claim**



An improvised a.c. limiter arrangement in a d.c. transmission line having earth wires, comprises connecting a.c. limiters which include reactive elements, in an electric circuit formed by the earth wires.

The loops formed by the earth wires and the a.c. limiters produce an electromagnetic effect on the loops formed by the line conductors. By suitably selecting the reactive elements, it is possible to raise the a.c. resistance of the loop formed by the line conductors and thus to reduce the a.c. component.

3,675,083

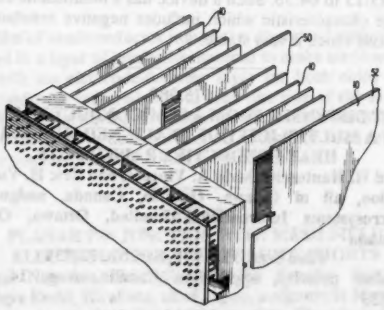
UNIVERSAL BUS ARRANGEMENT FOR DATA PROCESSING SYSTEMS

Donald A. White, Westminster, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Sept. 14, 1970, Ser. No. 72,092

Int. Cl. H05k *1/02*

U.S. Cl. 317—101 **4 Claims**



An arrangement for interconnecting circuit boards in a data processing system. Signals are coupled to and from individual circuit boards over contacts formed on the boards. Corresponding contacts on each board are reserved for a specific signal. In use, the boards are inserted in connector blocks which have corresponding terminal pins in circuit with the individual contacts. Another circuit board supports each connector block. Conductors on this board connect corresponding terminal pins on all the connector blocks in parallel so that any individual circuit board can be inserted in any connector block.

3,675,084

SIGNALING AND CONTROL APPARATUS SLIDABLY AND SWINGABLY MOUNTED ON A SUPPORTING CABINET

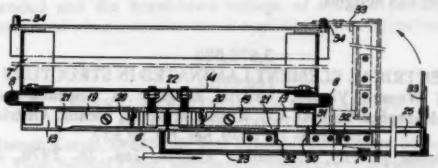
Andre Jammaud, Neuilly, Marne, France, assignor to Societe Industrielle Honeywell Bull Societe Anonyme, Paris, France

Filed March 10, 1971, Ser. No. 122,715

Claims priority, application France, March 20, 1970, 7010137

Int. Cl. H02b *1/06*

U.S. Cl. 317—101 CB **14 Claims**



A signaling and control apparatus mounted on a computer cabinet or the like for displaying visual signaling elements thereon in a plurality of directions, wherein a housing structure provided on one face with visual signaling elements is slidably supported on a pair of shutters, and wherein, in addition to a normal position where said face is visible from the front side, the housing structure can slide onto either of said shutters and turn thereon in such a manner that said face is visible from one side or from the opposite side of said cabinet.

3,675,085

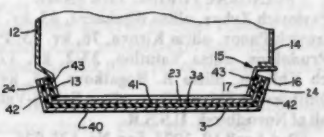
PANEL BOARD FOR STACKED ELECTRICAL DEVICES WITH SEALING COVERS

Harris I. Stanback, Lexington, Ky., assignor to Square D Company, Park Ridge, Ill.

Filed Aug. 13, 1971, Ser. No. 171,445

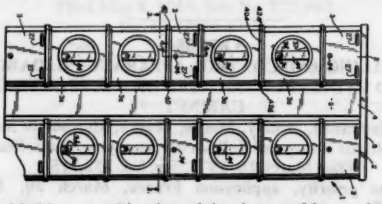
Int. Cl. H02b *1/12*

U.S. Cl. 317—106 **10 Claims**



A panelboard of the type having a plurality of open front compartments adapted to accommodate electrical devices, respectively, and arranged in an upright row, each compart-

ment having an individual cover. Each cover is connected at its upper margin to the panel adjacent the top of its associated compartment. The lower margin of the cover of each compartment overlies and conceals the connection of the cover of the compartment immediately therebeneath. A rain tight seal



is provided by a combination of the shapes of forward margins of the compartment walls, the shapes of flanges and lower margins of the respective covers comparable with said margins, and the arrangement of gaskets between the coacting flanges and margins.

3,675,086

ELECTRICAL ELEMENT LAMINATED IN STRUCTURE

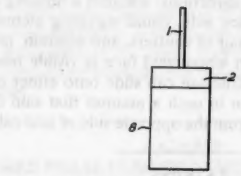
Kurt Wenzel, Vienna, Austria, assignor to Telephon-und Telegraphen-Fabriks A.G. Kapsch & Sohne, Vienna, Austria

Filed June 29, 1970, Ser. No. 50,537

Claims priority, application Austria, Jan. 26, 1970, A 672/70

Int. Cl. H01g 9/05

U.S. Cl. 317—230 **4 Claims**



The laminated electrical element, such as an electrolytic capacitor, voltage sensitive capacitor and the like, comprises, successively arranged, a highly porous substrate of a metal of the fifth group of the periodic system, an oxide film of said substrate metal, an electrolytically deposited oxide layer of a metal of the seventh group of the periodic system and a semiconductive intermediate (mixing) zone resulting between the oxide film and the oxide layer. The thickness of the oxide layer of a metal of the seventh group is in the range of five to 200 molecules.

3,675,087

ELECTROLYTIC CAPACITOR AND A METHOD OF MANUFACTURING THE SAME

Vladimir Pavlovich Zykov, ulitsa Bljukhera, 43, kv. 51; Alexei Alexandrovich Panov, ulitsa Kirova, 76, kv. 73; Pavel Alexeevich Prudnikov, ulitsa Vatutina, 33/2, kv. 12; Mikhail Ivanovich Khlopin, ulitsa B. Bogatkova, 25, kv. 47, and Alexei Dmitrievich Shlyapnikov, ulitsa Sakko-Vantsetti, 52, kv. 55, all of Novosibirsk, U.S.S.R.

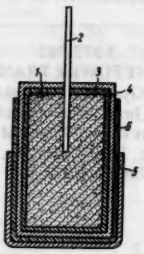
Filed April 19, 1971, Ser. No. 135,026

Claims priority, application U.S.S.R., April 20, 1970, 1423255

Int. Cl. H01g 9/05

U.S. Cl. 317—230 **3 Claims**

In an electrolytic capacitor having a positive and a negative electrode separated by a dielectric layer, the negative electrode is electrically connected to the current collector thereof via a contact conductor, the contact conductor (contact electrode) being a film formed from a mixture of carbon black, graphite and polymerized thermosetting resin. The contact electrode is manufactured by preparing a suspension comprising carbon black, graphite, thermosetting resin and a solvent for said resin, followed by applying the resulting suspension



onto the negative electrode surface and carrying out suspension coat drying at a temperature that provides for resin polymerization and solvent removal.

3,675,088

NEGATIVE RESISTANCE DEVICE

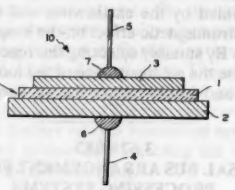
Masahiro Nagasawa, Hirakata, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed July 28, 1970, Ser. No. 58,782

Claims priority, application Japan, Dec. 7, 1969, 44/02158

Int. Cl. H01l 3/02

U.S. Cl. 317—234 R **6 Claims**



A non-rectifying monostable negative resistance device. The device has a glass layer 0.002 to 0.2 mm thick with a composition consisting essentially of, by analysis, tellurium, iron, and oxygen. Two electrodes are applied to opposite surfaces of said glass layer. The atomic ratio of tellurium to iron ranges from 85:15 to 64:36. Such a device has a monostable current-voltage characteristic which includes negative resistance regions and which is very stable.

3,675,089

HEAT DISPENSER FROM A SEMICONDUCTOR WAFER BY A MULTIPLICITY OF UNALIGNED MINUSCULE HEAT CONDUCTIVE RAISED DOTS

Gerald H. Hantusch; David A. Vincent, and Eric H. Van Tongerloo, all of Ottawa, Ontario, Canada, assignors to Microsystems International Limited, Ottawa, Ontario, Canada

Filed Sept. 11, 1970, Ser. No. 72,559

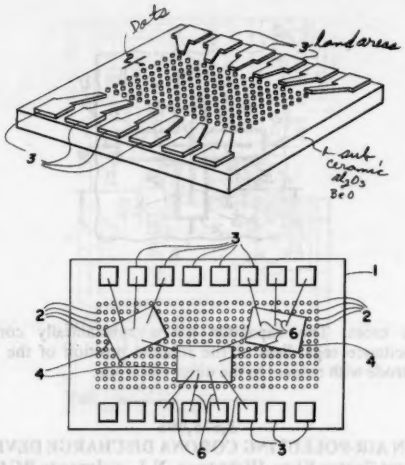
Claims priority, application Canada, Aug. 14, 1970, 090,833

Int. Cl. H01l 3/00, 5/00

U.S. Cl. 317—234 R **8 Claims**

A heat sink for a semiconductor wafer comprising a multiplicity of individual miniscule raised dots of heat conducting material adherent to the surface of an electrically insulative, but heat conductive substrate. The wafer is mounted on the tops of the dots. The dots provide heat conductive paths from

the wafer to the substrate, do not short circuit between exposed elements of the wafer, while taking up the strain of differential expansion and contraction between the wafer and the substrate during heating and cooling.



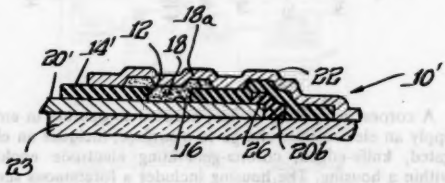
3,675,090
FILM DEPOSITED SEMICONDUCTOR DEVICES

Ronald G. Neale, Birmingham, Mich., assignor to Energy Conversion Devices, Inc., Troy, Mich.

Continuation-in-part of Ser. Nos. 773,013, Nov. 4, 1968, and Ser. No. 806,994, March 13, 1969. This application Oct. 17, 1969, Ser. No. 867,341. The portion of the term of this patent subsequent to Oct. 5, 1988, has been disclaimed.

Int. Cl. H01l *3/00, 19/00*

U.S. Cl. 317—234 R **26 Claims**



A film of semiconductor material is deposited within a pore formed in a layer of insulating material to make electrical contact with an electrode-forming layer on both sides of the semiconductor material with at least one side of the semiconductor material having an effective contact area limited by the size of the pore to define a limited volume of such semiconductor material through which current can flow.

3,675,091
PLANAR P-N JUNCTION WITH MESH FIELD ELECTRODE TO AVOID PINHOLE SHORTS

Susumu Naomoto, Ibaragi; Tadataka Kaneko, Suita, and Hideya Esaki, Hirakata, all of Japan, assignors to Matsushita Electronics Corporation and Matsushita Electric Industrial Co., Ltd., Osaka, Japan

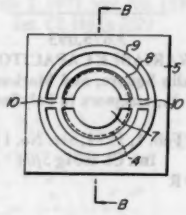
Filed May 21, 1970, Ser. No. 39,215

Claims priority, application Japan, May 28, 1969, 44/43039

Int. Cl. H01l *5/06*

U.S. Cl. 317—235 R **1 Claim**

A planar p-n junction semiconductor device, wherein an electrode surrounding a p-n junction is provided on a protective film covering the surface of a higher resistivity region of two regions of different conductivity types which form a p-n junction, another electrode is provided in a lower resistivity region in ohmic contact therewith, said two electrodes being electrically connected, and the space charge region is extended and the breakdown voltage of the p-n junction is enhanced when a reverse bias is applied to the p-n junction.



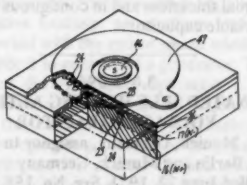
3,675,092
SURFACE CONTROLLED AVALANCHE SEMICONDUCTOR DEVICE

Joseph Kocsis, Sunnyvale, and Thomas Peter Cauge, Mountain View, both of Calif., assignors to Signetics Corporation, Sunnyvale, Calif.

Filed July 13, 1970, Ser. No. 54,097

Int. Cl. H01l *11/02*

U.S. Cl. 317—235 R **10 Claims**



Surface controlled avalanche semiconductor device formed of a semiconductor body having a planar surface. The semiconductor body has an impurity therein so it has a conductivity of one type. Regions of opposite conductivity are formed in the body and provide P-N junctions which extend to the surface in such a manner that they form a pattern of a plurality of closed lines enclosing a plurality of small areas distributed over the surface with at least one portion of the surface being free of said P-N junctions and being in contact with said region of opposite conductivity type. A layer of insulating material overlies the surface. Source metallization is disposed on the layer of insulating material and extends through the layer of insulating material to make contact with said portion of the surface. Gate metallization separated from the source metallization overlies the layer of insulating material and the P-N junctions.

In the method for forming a surface controlled avalanche semiconductor device, there are formed in a semiconductor body of one conductivity type a plurality of regions of opposite conductivity type to form P-N junctions which extend to the surface so that a pattern is formed consisting of a plurality of closed lines which enclose small areas which are distributed over the surface of the semiconductor body with the exception of a small portion of the surface of the semiconductor body which is free of such P-N junctions and which is in contact with said region of opposite conductivity type. A layer of insulating material is formed on the surface. An opening is formed in the layer of insulating material overlying said portion of the surface area. Metallization is formed on the insulat-

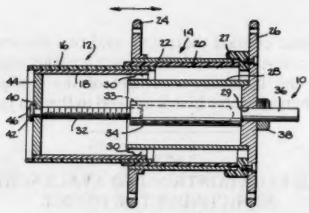
ing layer in such a manner that source metallization extends through the opening in the insulating layer and makes contact with said region of opposite conductivity type and gate metallization is provided which overlies the insulating layer and said P-N junctions.

3,675,093

VARIABLE CAPACITOR

Paul Russo, Franklin Square, and Markus Mowogrozki, New York, both of N.Y., assignors to Polyflon Corporation, New Rochelle, N.Y.

Filed Feb. 1, 1971, Ser. No. 111,567
Int. Cl. H01g 5/04
U.S. Cl. 317—249 R **7 Claims**



The invention relates to variable capacitors suitable for high frequency, high voltage, low loss applications.

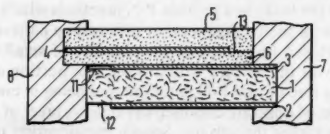
The capacitor is formed of at least two sections or elements which are relatively movable to achieve selective capacitance variation. The capacitor sections or elements each comprise a metallic layer, serving as an electrode, secured to a layer of dielectric material with the layers of dielectric material being of generally equal thickness and in contiguous slidable contact to form the variable capacitor.

3,675,094

IMPREGNATED SELF-HEALING ALTERNATING VOLTAGE CAPACITOR

Walter Voelkl, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed June 22, 1971, Ser. No. 155,484
Claims priority, application Germany, June 25, 1970, P 20 31 741.3
Int. Cl. H01g 3/215
U.S. Cl. 317—258 **5 Claims**



An AC voltage capacitor employs a pair of layers of varnish with a metallic layer therebetween to form one electrode of the capacitor, the layer structure being carried by a second layer structure including a rough surface dielectric having metallic layers on both sides which are electrically connected together to form the other electrode of the capacitor.

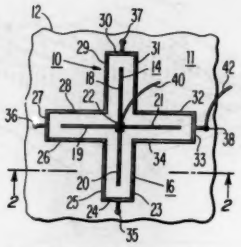
3,675,095

CAPACITORS OF CONSTANT CAPACITANCE

William Lester Lehmann, Indianapolis, Ind., assignor to RCA Corporation

Filed June 10, 1971, Ser. No. 151,717
Int. Cl. H01g 1/035
U.S. Cl. 317—261 **6 Claims**

An improved printed capacitor includes a pair of inner and outer, closely spaced, coplanar electrodes. The inner electrode has the general shape of a cross, and the outer electrode surrounds the inner electrode and also has the general shape



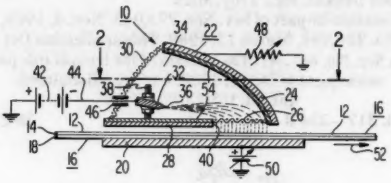
of a cross. The capacitor has a substantially constant capacitance regardless of the relative position of the inner electrode with respect to the outer electrode.

3,675,096

NON AIR-POLLUTING CORONA DISCHARGE DEVICES

Helmut Gustav Kiess, Hightstown, N.J., assignor to RCA Corporation

Filed April 2, 1971, Ser. No. 130,644
Int. Cl. H01t 19/00
U.S. Cl. 317—262 A **7 Claims**



A corona generating device, adapted to operate in air, to apply an electrostatic charge to a surface, includes an elongated, knife-edged, corona-generating electrode enclosed within a housing. The housing includes a foraminous screen that has an optical transmission of less than 50 percent to prevent ultraviolet light produced by the corona from reaching the surface to be charged. The screen and the interior of the housing are formed, or coated, with a catalytic material, such as silver, to convert any ozone formed by the corona discharge, to oxygen, thereby preventing pollution of the air with toxic ozone.

3,675,097

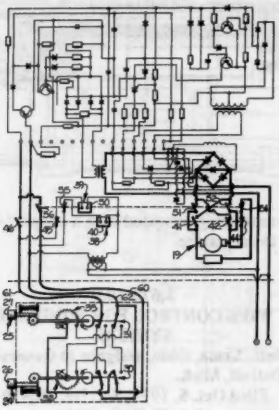
REMOTE CRANE MOTOR CONTROL WITH VARIABLE DIRECTION AND SPEED OF MOVEMENT

William L. Mulligan, Charlotte, N.C., assignor to Parks-Cramer Company, Fitchburg, Mass.

Filed June 24, 1970, Ser. No. 49,224
Int. Cl. H02p 7/20
U.S. Cl. 318—17 **8 Claims**

A crane having at least one movable member and a drive for moving the movable member wherein the control for the crane permits an operator to controllably vary the direction and speed of movement of the movable member. Adaptation of the control to cranes of otherwise conventional construction or to pre-existing cranes is facilitated by an advantageous

electrical circuit arrangement, in which direction and speed signals are conducted through a minimum number of electri-



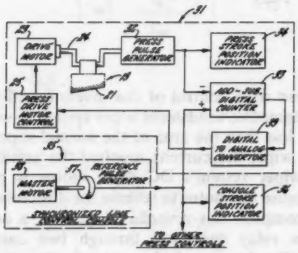
cal conductors in accomplishing the controlled variation of direction and speed of movement.

3,675,098

DIGITAL CONTROL OF PRESS SYNCHRONIZATION

Francis E. Heiberger, Elmhurst, Ill., assignor to Danly Machine Corporation

Filed June 11, 1970, Ser. No. 45,316
Int. Cl. H02p 5/50
U.S. Cl. 318—85 **5 Claims**



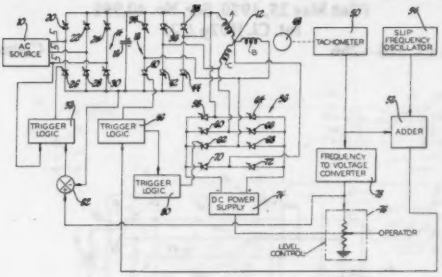
For automatically synchronizing the operation of a line of independently driven presses, each equipped with a variable speed drive, a digital control system in which respective digital signals representative of the instantaneous phase positions of the several presses in the line are each differentially compared against a digital reference signal representative of reference phase position. As a result of the differential comparisons, if the phase of any given press leads or lags the reference phase, a phase error is detected. This phase error is converted to an analog control signal which has a sense dependent on whether the press phase is leading or lagging the reference phase and a magnitude dependent on the amount of such lead or lag, and the control signal is fed back to the press drive to speed up or slow down the press as necessary to bring it back into step. The digital reference phase position signal cycles at the desired line operating speed, so that all presses operate in synchronism at that speed.

3,675,099

INDUCTION MOTOR REGENERATIVE BRAKING SYSTEM

Richard W. Johnston, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed July 2, 1971, Ser. No. 159,206
Int. Cl. H02p 3/22
U.S. Cl. 318—211 **8 Claims**



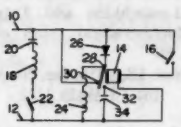
A controlled slip AC induction motor system is provided with normal and regenerative braking modes of operation. During normal operation, voltage from a source of alternating voltage is rectified by a full-wave bridge rectifier and supplied to the input of an inverter connected with the winding of the motor. A filter capacitor is interposed between the bridge rectifier and the inverter to filter the DC input voltage to the inverter. A feedback control regulates the switching repetition rate of controlled rectifiers in the inverter to maintain a preselected slip frequency for the voltage supplied the motor. During regenerative braking, an auxiliary power source is selectively connected with the motor phase windings to excite the motor to enable it to operate as a generator. The feedback control loop used during normal operation is used during periods of regeneration to regulate the frequency of the excitation voltage; this control provides a preselected negative slip frequency for operating the motor as a generator. The power feed inverter used in normal operation functions as a bridge rectifier transferring power from the motor to the filter capacitor during braking. The effective load impedance provided by the capacitor is electronically controlled by periodically discharging the capacitor a predetermined amount through the full-wave bridge rectifier used in normal operation (functioning as an inverter during regeneration) to the source of alternating voltage. Flexible electronic control of regeneration by the induction motor is obtained by this system.

3,675,100

CIRCUIT FOR MULTI-SPEED TWO-PHASE MOTOR

Thomas J. McNamara, and Arlon G. Sangster, both of c/o Decitek Division of the Jamesbury Corp., 15 Sagamore Road, Worcester, Mass.

Continuation-in-part of Ser. No. 783,867, Dec. 16, 1968, abandoned. This application Jan. 15, 1971, Ser. No. 106,796
Int. Cl. H02p 7/36
U.S. Cl. 318—220 R **3 Claims**



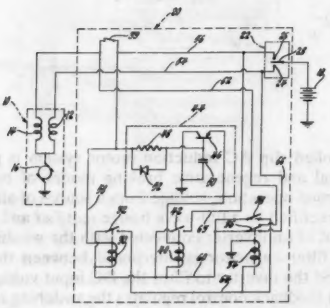
This circuit utilizes an RLC network, using the motor winding as a component, to alter the speed of an ac two-phase

servo motor. The RLC circuit produces a dc component and variable frequency ac component which effectively produce a signal on the control winding of the motor. Power for the RLC network is taken from the ac line through a rectifier (diode).

3,675,101
POWER WINDOW REVERSING UNIT

Samuel B. Robbins, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed May 25, 1970, Ser. No. 40,991
Int. Cl. H02p 1/22
U.S. Cl. 318—266 **7 Claims**



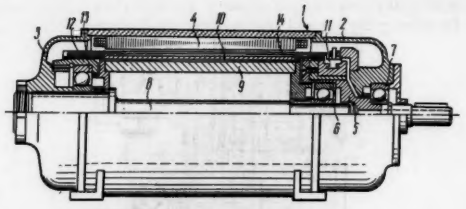
A circuit for controlling a power window operating motor having first and second field windings selectively energized to open and close a window. Placement of a switch in a window opening setting energizes the first winding and opens the window. Placement of the switch in a window closing setting energizes the second winding so as to close the window. Should the window encounter an obstacle when closing the current to the second winding will be increased above a certain level, energizing a current responsive relay and a reversing relay that reverses the motor by deenergizing the second winding and energizing the first winding. A time delay network is provided for preventing the window from being reversed for a predetermined time after the switch is placed in the window closing setting so as to prevent reversal of the motor due to its starting current transients. A limit switch responsive to the window position is provided for preventing reversal of the window when the window is substantially closed so as to permit the motor to draw an increased current when it seals the window closed.

3,675,102
DYNAMO-ELECTRIC MACHINE

Oleg Pavlovich Sidorov, ulitsa Golyanova, korpus 202, kv. 8; Pavel Sergeevich Ryabtsev, Mukomolny proezd, 15, korpus 2, kv. 8, both of Moscow, and Rostislav Ivanovich Lastochkin, deceased, late of Moscow, U.S.S.R. (by Nadezhda Andreevna Lastochkina and Tatyana Rostislavovna Lastochkina, administrators), both of Scherbakovskaya ulitsa, 40/42, Kv. 50

Filed Nov. 18, 1970, Ser. No. 90,522
Int. Cl. H02k 1/22
U.S. Cl. 310—266 **2 Claims**

A dynamo-electric machine, in particular a direct-current electric machine in which a rotatable hollow armature with windings arranged thereon is placed into an air gap between an armature core and pole pieces, with one end of said hollow armature being secured to a shaft of the machine and the



other end thereof being provided with a support which is used for centering the armature.

3,675,103
SEGMENT WIPE CONTROL FOR WINDSHIELD WIPER SYSTEM

James O. Elliott, Xenia, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 6, 1970, Ser. No. 78,439
Int. Cl. B60s 1/02
U.S. Cl. 318—281 **3 Claims**

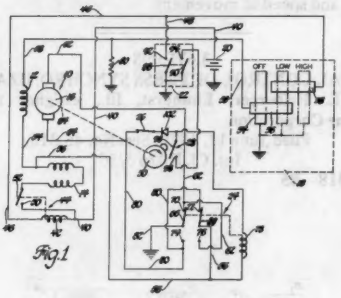


Fig. 1

The segment wipe control of this invention affords operation of an automotive windshield wiper system to wipe an area substantially less than the area of the normal wipe. To effect the segment wipe, the current supplied the armature of the windshield wiper system's DC drive motor is periodically reversed to cause the motor to reverse the direction of its rotation. To accomplish this reversal of current, a double-pole, double-throw relay energized through two cam actuated switches is utilized to switch the motor feed connections and concurrently reverse the polarity of the current supplied to the motor. The cam actuated switches are alternately actuated by a cam driven by the motor's output shaft, thus synchronizing the reversals of the DC motor with the sweep of the windshield wiper blades which are driven by linkage connected with the motor's output shaft.

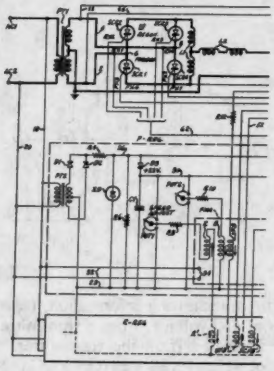
3,675,104
SINGLE-PHASE FULL-WAVE REGENERATIVE SCR SHUNT MOTOR CONTROL SYSTEM

Arthur F. Allison, West Bend; Donald J. Greening, Thiensville, and Anton N. Mollgaard, Pewaukee, all of Wis., assignors to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Dec. 17, 1970, Ser. No. 99,065
Int. Cl. H02p 5/16
U.S. Cl. 318—345 **10 Claims**

A single-phase full-wave regenerative SCR (silicon controlled rectifier) drive having a series and shunt, T-network, reactor configuration, minimum firing of both forward and

regenerative SCR's, and current feedback regulation. The reactor configuration along with the controlled minimum firing angle assures continuous current through the motor armature over substantially the entire load range except for the low 10 to 20 percent whereas normally continuous current occurred only in about the upper half of the load range. This allows the current regulator to be designated for continuous current rather than discontinuous current, having higher gain, and affording better control. By continuous current, heating also is reduced.



3,675,105

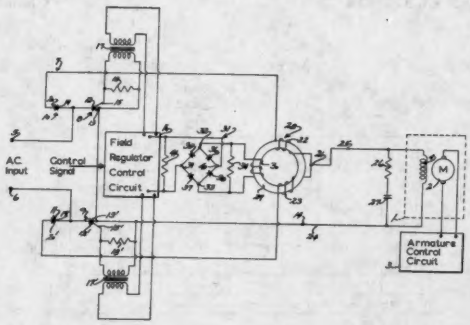
CURRENT SENSING APPARATUS

Andrew Petrigalla, Parma, Ohio, assignor to A. O. Smith Corporation, Milwaukee, Wis.

Filed Jan. 18, 1971, Ser. No. 107,255

Int. Cl. H02p *5/16*

U.S. Cl. 318—356 **9 Claims**



A current transformer having a pair of primary windings is connected between a single phase thyristor-diode full-wave bridge network and a shunt field winding of a D.C. motor to linearly sense the direct current flowing within the field winding. Opposed magnetic flux signals are alternately induced within the current transformer core by the direct current flowing through the winding. A secondary winding is coupled to the current transformer core to provide an alternating current signal proportional to the flux signals. A full wave rectifier is connected to the secondary winding and supplies a unidirectional signal to a parallel connected resistor thereby providing an isolated analog output voltage proportional to the direct current flowing within the D.C. motor field winding.

3,675,106

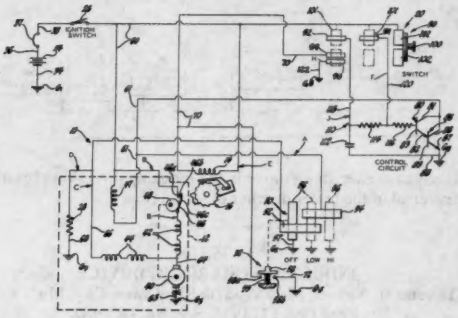
ELECTRONIC DEMAND WINDSHIELD WIPER CONTROL

Bohdan I. Pryjmak, Kettering, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed April 20, 1971, Ser. No. 135,562

Int. Cl. H02k *3/08*

U.S. Cl. 318—443 **5 Claims**



In a preferred form, this disclosure relates to an electrical control system for controlling operation of a windshield wiper unit and a washer unit for an automotive vehicle, and in which the wiper unit has a pair of oscillatable wipers which are moved through outboard and inboard strokes during each cycle of operation. The electrical control system comprises a power source, an electric motor means for driving the wipers, an electrically operated washer unit and a first control circuit means including a manual switch for effecting either low or high speed continuous operation of the wipers and a second manual switch for controlling operation of the washer unit. The electrical control system further includes a second control circuit means in parallel with a first control circuit means and which includes a transistor means connected in series with the motor means, an RC electrical time delay means connected with the base of the transistor means and a push button control switch. The control switch is operable when partially depressed to effect operation of the wiper motor through either a single cycle of operation, any number up to a predetermined number of cycles of operation or any number plus a predetermined number of cycles of operation depending upon the length of time the control switch is partially depressed prior to being released and is operable when momentarily fully depressed to effect simultaneous operation of the washer unit and the wiper unit for a predetermined number of cycles of operation and with the wiper motor shutting off automatically subsequent to the cessation of washer operation.

3,675,107

TURRET INDEXING CONTROL SYSTEM

Joseph J. Barber, Williamsville, N.Y., assignor to Houdaille Industries, Inc., Buffalo, N.Y.

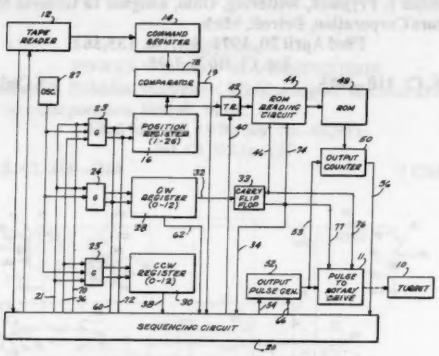
Filed Oct. 1, 1970, Ser. No. 77,139

Int. Cl. G05b *19/28*

U.S. Cl. 318—601 **4 Claims**

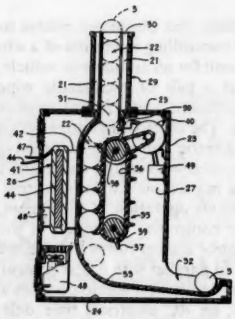
For controlling indexing of the turret of a punching press where tool stations have different distances therebetween, a read only memory stores the number of indexing pulses required to index between each pair of adjacent stations, and a

readout circuit serves to read out the number of such pulses required to execute a desired indexing operation. Preferably



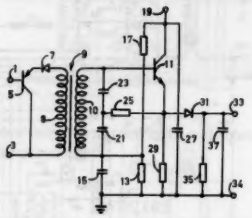
the system executes a move in the indexing direction requiring traversal of the lesser number of tool stations.

3,675,108
INDUCTION CHARGING DEVICE
Thomas H. Nicholl, 1204 W. 27th St., Kansas City, Mo.
Filed Oct. 12, 1971, Ser. No. 187,982
Int. Cl. H01m *45/04*
U.S. Cl. 320—2 **11 Claims**



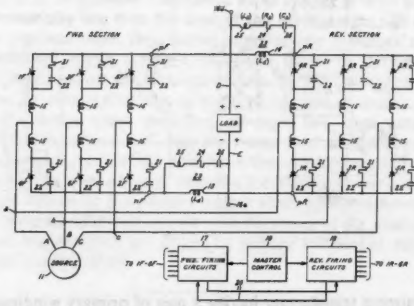
An induction charging device for recharging a battery or batteries for use in a rechargeable battery powered appliance is disclosed and includes a housing having walls defining a passage extending therethrough with the passage having an entrance shaped to receive a rechargeable battery powered appliance. An appliance support member is positioned within the passage to receive an appliance or battery container and move same along a battery recharging path having a transformer primary coil and core within the housing and arranged adjacent the battery recharging path so that a secondary coil and core within the appliance or battery container will move along the battery recharging path with the respective cores aligned. A current is connected to the primary coil to thereby energize the secondary coil in the appliance or battery container and direct current through a rectifier in the appliance whereby a unidirectional current is supplied to the rechargeable battery or batteries in the appliance. Cooperative portions on the passage defining walls and a body of the appliance or battery container in the battery recharging path and act as a key whereby only an appliance or battery container having a proper size ans shape may be received in and move in the respective cooperative interengaging portions and have the battery or batteries therein charged in the induction charging device.

3,675,109
INFORMATION TRANSMITTING DEVICE
Hilding G. Skoog, Balsta, Sweden, assignor to Sevenska Dalaregisster AB, Solna, Sweden
Filed Nov. 18, 1970, Ser. No. 90,679
Int. Cl. H02m *3/22*
U.S. Cl. 321—2 **9 Claims**



A device for transmitting information, represented by different levels of DC-voltage, from a transmitter to a receiver galvanically separated from the transmitter. A transformer, one winding of which forms a part of a LC-oscillator, and the second winding of the transformer is connected to a first transistor via a diode, the transistor in emitter-follower configuration. A second transistor, also having an emitter follower configuration is a part of the LC-oscillator. A second output diode is connected to the emitter of the second transistor. The arrangement being so designed that the voltage level appearing at the cathode of the second diode corresponds to the input voltage level appearing at the input of the first transistor.

3,675,110
MEANS FOR DAMPING VOLTAGE OSCILLATIONS IN SOLID-STATE SWITCHING CIRCUITS
Fred W. Kelley, Jr., Media, Pa., assignor to General Electric Company
Filed Jan. 27, 1971, Ser. No. 110,165
Int. Cl. H02m *1/18*
U.S. Cl. 321—14 **9 Claims**

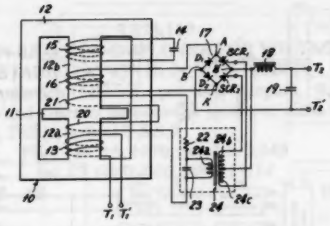


A thyristor is serially joined to an inductor and is shunted by a snubber circuit comprising a resistor in series with a capacitor. When subjected to a stepped change in voltage, the series combination of the inductor and the snubber circuit may become oscillatory. To prevent the voltage across the thyristor from undesirably overshooting, a tuned damping circuit is connected in parallel with the inductor, or alternatively in parallel with the snubber circuit.

3,675,111
AUTOMATIC DC VOLTAGE REGULATING SYSTEM

Toshikatsu Sakka, 8-12, 4-chome, Higashi-Mukojima, Sumida-ku, Tokyo, and Kiyoshi Takano, 1814 Mutsuura-cho, Kanazawa-ku, Yokohama-shi, Kanagawa, both of Japan

Filed June 11, 1971, Ser. No. 152,049
Claims priority, application Japan, June 25, 1970, 45/55721
Int. Cl. H02m 7/24; G05f 1/20
U.S. Cl. 321—18 9 Claims

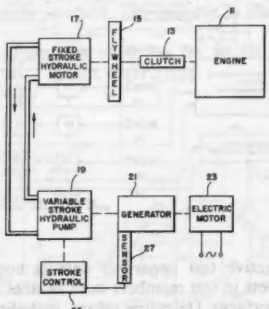


An automatic DC voltage regulating system includes an automatic AC voltage regulator whose output impedance is inductive. Voltages respectively in phase with the voltages of an input and an output winding of this AC voltage regulator are combined by means of a pair of additional windings magnetically connected with the input and output windings and themselves interconnected in series. A series circuit of a resistance and a capacitor, for example, is connected to the aforesaid additional windings so as to cause a desired phase lag to the above obtained resultant of the input and output voltages of the AC voltage regulator. The output voltage of this resistance-capacitor series circuit is applied via a transformer to a rectifier connected in tandem with the AC voltage regulator, thereby controlling the gate of at least one thyristor included in the rectifier in accordance with variation in the value of the load current. There are also disclosed herein several other examples of the automatic DC voltage regulating system of the invention.

3,675,112
STANDBY POWER SYSTEM

Peter B. Smith, Monroe, Conn., assignor to Dynamics Corporation of America, New York, N.Y.

Filed July 9, 1970, Ser. No. 53,432
Int. Cl. H02k 7/02
U.S. Cl. 322—4 3 Claims

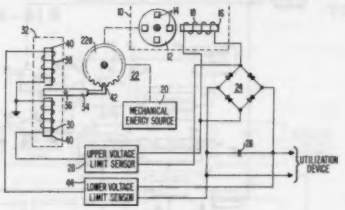


A standby generator having a flywheel storage system coupled to the standby engine. The flywheel is also coupled to the motor generator set through a hydrostatic transmission system including a fixed stroke hydraulic motor and a variable stroke hydraulic pump.

3,675,113
SYSTEM FOR THE GENERATION OF ELECTRICAL POWER HAVING A SPRING POWERED PRIME MOVER RESPONSIVE TO OUTPUT VOLTAGE

Clifford J. Bader, West Chester, and Richard P. Branco, Bridgeport, both of Pa., assignors to Burroughs Corporation, Detroit, Mich.

Filed Nov. 24, 1971, Ser. No. 201,638
Int. Cl. H02p 9/04
U.S. Cl. 322—28 10 Claims



The present disclosure describes a system for providing a nonvolatile electrical energy source which employs a finite source of mechanical energy, metered in accordance with the electrical power demands of the utilization device. A basic embodiment of the system contemplated by the invention as a replacement for the volatile electro-chemical storage battery with its limited shelf life, comprises a spring-wound generator, electrical energy storage means, and electrical latching means controlled by upper and lower voltage limit sensors for metering out the mechanical energy of the spring as a function of the level of electrical energy present at any given time in the storage means.

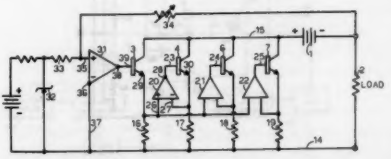
ERRATUM

For Class 322—31 see:
Patent No. 3,675,117

3,675,114
HIGH CURRENT VOLTAGE/CURRENT REGULATOR EMPLOYING A PLURALITY OF PARALLEL CONNECTED POWER TRANSISTORS

Sarkis Nercessian, Long Island, N.Y., assignor to Forbro Design Corp., New York, N.Y.

Filed June 14, 1971, Ser. No. 152,675
Int. Cl. G05f 1/56
U.S. Cl. 323—9 5 Claims

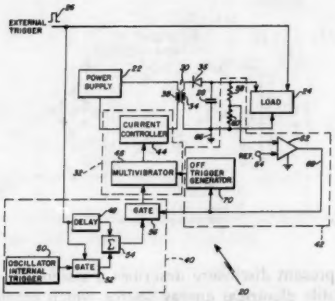


In a high current regulator employing high power parallel connected pass transistors, equal current sharing is forced by comparing the voltage drop across small emitter resistors and by means of differential (operational) amplifiers forcing these voltage drops to be substantially equal at all output currents. Three additional quantities are controlled; first, output voltage; second, output current; and third, fold-back overload current characteristics. The overall performance in all major characteristics is enhanced by the liberal use of high gain integrated circuit operational amplifiers.

3,675,115
POWER SUPPLY PROVIDING SYNCHRONIZED ENERGIZATION OF A LOAD

James P. O'Loughlin, Sudbury, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Nov. 26, 1969, Ser. No. 880,070
Int. Cl. G05f 1/56
U.S. Cl. 323—6 4 Claims

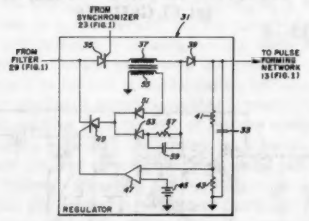


A power supply having an energy storage capacitor for supplying energy at a predetermined voltage to a pulsed load, and a charging circuit operative during recurring intervals between the pulsing of the load and responsive to the magnitude of the voltage supplied to the pulsed load for charging the energy storage capacitor. A transformer is provided in combination with the charging circuit to isolate the energy storage capacitor from the charging circuit during the pulsing of the load.

3,675,116
RESONANT CHARGING CIRCUIT

Henry M. Israel, 1/56, Worcester, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed March 15, 1971, Ser. No. 124,136
Int. Cl. G05f 1/56
U.S. Cl. 323—17 1 Claim

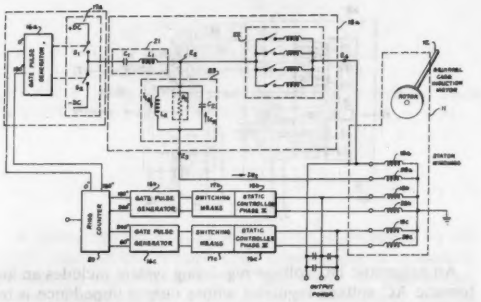


A resonant charging choke and switching arrangement in a regulator for controlling the voltage across a capacitive storage element despite large variations in the voltage of a source of DC power for such element, the switching arrangement being operated through a control circuit: (a) electrically to disconnect the resonant charging choke from the capacitive storage element; and, (b) electrically to connect the resonant charging choke, through a low impedance circuit to the source of DC power when the voltage across the capacitive storage element reaches a predetermined level.

3,675,117
ASYNCHRONOUS GENERATOR DEVICE

Eberhart Reimers, 7700 Random Run Lane #201, Falls Church, Va.

Continuation-in-part of Ser. No. 55,205, July 15, 1970. This application April 26, 1971, Ser. No. 137,368
Int. Cl. H02p 9/46
U.S. Cl. 322—31 8 Claims

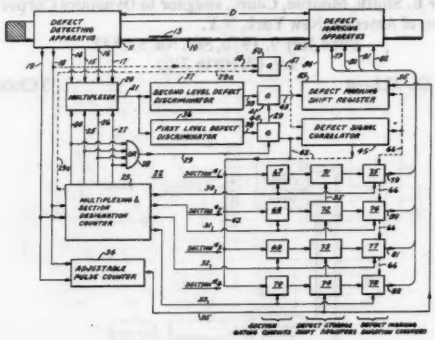


The drive means of this invention comprises a squirrel cage induction motor adapted to operate as an asynchronous alternator without the use of an auxiliary synchronous machine. This relatively light weight drive means is especially appropriate for vehicle propulsion.

3,675,118
MULTI-PROBE METOD AND APPARATUS FOR DETECTING, CORRELATING AND CLASSIFYING DEFECTS IN TEST MEMBERS

Robert C. Booth, Bethlehem, Pa., assignor to Bethlehem Steel Corporation

Filed April 21, 1970, Ser. No. 30,397
Int. Cl. G01r 33/12
U.S. Cl. 324—37 18 Claims



Nondestructive test apparatus detects both straight and skewed defects in test members such as steel billets and bars having flat surfaces. Detecting means, including a plurality of probes adapted to scan a surface of said member sequentially and cyclically during relative lengthwise movement therewith, produces a plurality of electrical signals representative of defects detected in said member. The plurality of electrical signals are selected sequentially one at a time by a multiplexer. The selected electrical signals cause defect pulses to be produced and those pulses are coordinated with probe posi-

tion signals in electronic circuits which classify the defects according to location, or location in combination with level of defect severity and/or length, in a longitudinally extending section of the test member. A signal correlator may be added to reject noise and false defect pulses as well as to accommodate skewed defects when either or both such situations are encountered. The finally processed defect pulses are utilized, for example, to activate reworkable or rejectable defect markers downstream of the probe over each section of the scanned surface where the defects occurred in said member

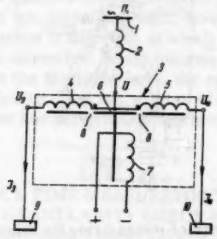
---

3,675,119

TWIN REACTOR EMPLOYED FOR VOLTAGE STABILIZATION IN POWER PLANTS

Mark Samuilovich Libkind, pereulok Stopani, 8, kv. 6, Moscow, and Gurami Semenovich Lezhava, ulitsa Pavlova, 49, kv. 8, Tbilisi, both of U.S.S.R.

Filed Jan. 15, 1970, Ser. No. 3,145
Int. Cl. G05f 7/00; H01f 29/14
U.S. Cl. 323—48 **10 Claims**



A duplex reactor having two inductively coupled working windings connected in series opposition. The windings having a common output lead connected to a power source and respective output leads connected to consumer loads. A member which controls the mutual inductance of the working windings is arranged on a magnetic core.

ERRATUM

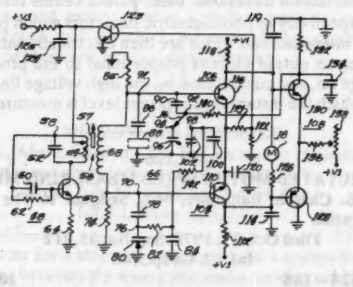
For Class 324—37 see:
Patent No. 3,675,118

3,675,120

IMPEDANCE MEASURING CIRCUIT INCLUDING MEANS FOR AUTOMATICALLY ADJUSTING INITIAL CONDUCTORS THEREOF

George H. Fathauer, Decatur, Ill., assignor to Harold O. Hill, Jr.

Filed April 30, 1970, Ser. No. 33,326
Int. Cl. G01r 27/26
U.S. Cl. 324—61 R **13 Claims**



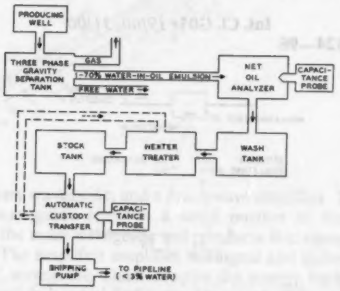
A grain moisture tester having an impedance measuring capacitive bridge circuit with an unknown capacitance, a manually variable capacitor, and a varactor diode in the arms thereof and an automatic balance circuit including a differential amplifier with inputs coupled across the bridge null points and an output d.c. coupled to the varactor diode and controlling its capacitance is disclosed.

3,675,121

DIELECTRIC CONSTANT MEASUREMENT METHOD

Don D. Thompson, Corona Del Mar, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed June 26, 1970, Ser. No. 50,022
Int. Cl. G01r 27/26
U.S. Cl. 324—61 R **7 Claims**



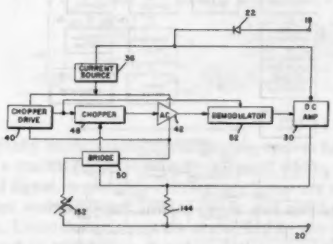
The real part of the complex dielectric constant of a fluid medium containing conducting impurities and water is accurately measured by avoiding the effects of dielectric dispersion and water dipole absorption. Dielectric dispersion is avoided by operating the capacitance probe circuit at a frequency above about 10 megahertz. Water dipole absorption is avoided by operating a capacitance probe circuit at a frequency below about 300 megahertz.

3,675,122

TWO-WIRE CURRENT TRANSMITTER EMPLOYING A STABILIZED CURRENT SOURCE IN ONE ELECTRICAL CIRCUIT CONTAINING CONTROL MEANS IN SERIES THEREWITH FOR CONTROLLING A DIRECT CURRENT AMPLIFIER CONTAINED IN A PARALLEL CIRCUIT

Robert C. Rose, Minneapolis, Minn., assignor to Rosemount Engineering Company, Eden Prairie, Minn.

Filed Oct. 27, 1969, Ser. No. 869,687
Int. Cl. G01r 27/02
U.S. Cl. 324—62 **13 Claims**



A transmitter controls the flow of load current through only two wires in accordance with the magnitude of a variable condition. Within the transmitter the current follows two paths, one portion of the current flowing through a direct current amplifier and the remaining portion flowing through a stabilized current source which provides the sole energization for

certain components, including a condition responsive bridge network, in order to operate the DC amplifier in response to the condition sensed by the bridge network. The current recombines to constitute the load current that is indicative of the magnitude of the variable condition.

3,675,123
DEVICE FOR MEASURING CURRENTS IN A HIGH VOLTAGE CONDUCTOR BY MODULATED RADIATED BEAMS

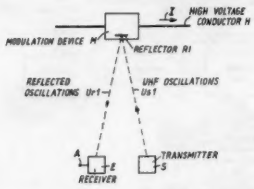
Wolfgang Hermstein, and Klaus Mollenbeck, both of Berlin, Germany, assignors to Siemens Aktiengesellschaft, Berlin, Germany

Filed Aug. 5, 1970, Ser. No. 61,064

Claims priority, application Germany, Aug. 6, 1969, P 19 40 614.5

Int. Cl. G01r *19/00, 31/00*

U.S. Cl. 324—96 **9 Claims**



A modulation device at a high voltage has a reflector for reflecting high frequency oscillations in accordance with the magnitude of the current to be measured. The reflector has resonant characteristics corresponding to the magnitude of the current to be measured. A transmitter transmits high frequency oscillations to the reflector. A receiver converts the reflected oscillations to signals corresponding to the magnitude of the current to be measured.

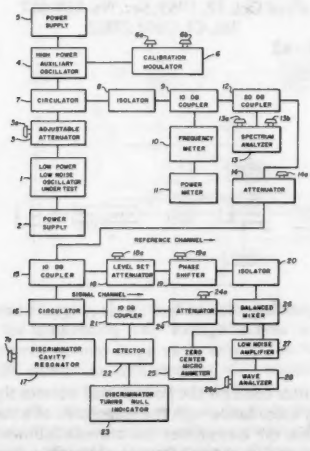
3,675,124
APPARATUS FOR MEASURING FREQUENCY MODULATION NOISE SIGNALS AND FOR CALIBRATING SAME

James R. Ashley, Colorado Springs, Colo., and Frank M. Palka, Clearwater, Fla., assignors to Sperry Rand Corporation

Filed Oct. 28, 1970, Ser. No. 84,673

Int. Cl. G01r *27/00*

U.S. Cl. 324—57 **6 Claims**



Apparatus is provided for the measurement of frequency modulation noise on the carrier signal output of a low-noise, low-power, high-frequency diode oscillator under test. An auxiliary injection phase-locked oscillator, driven by the oscillator under test, is used to provide a signal of sufficient level for operation of a high-frequency discriminator used for noise measurement. The auxiliary oscillator may additionally be used for calibration of the discriminator preliminary to taking noise measurements.

3,675,125
OPTICAL WATTMETER

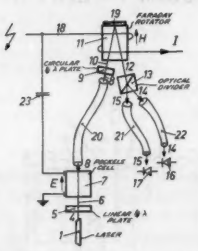
Andre Jaecklin, Ennetbaden, Switzerland, assignor to Aktiengesellschaft Brown, Boveri & Cie, Baden, Switzerland

Filed Dec. 1, 1970, Ser. No. 94,027

Claims priority, application Switzerland, Dec. 10, 1969, 18403/69

Int. Cl. G01r *31/00, 7/00, 21/00*

U.S. Cl. 324—96 **9 Claims**



An optical wattmeter for measuring the magnitude of the instantaneous power being transmitted over a high voltage line utilizes a monochromatic circularly polarized light beam which is transmitted through an electro-optical modulator such as K_{ETT} or Pockels cell subjected to an electric field produced by the high voltage line proportional to the voltage component of the power to be measured. The light beam, doubly refracted in the modulator thereby to produce an elliptically polarized beam, the eccentricity of the ellipse being variable with the line voltage, is passed through a circular quarter-wave plate and then delivered to a Faraday rotator which is subjected to a magnetic field produced by the high voltage line proportional to the current component of the power to be measured. The magnetic field produces a phase shift proportional to the magnetic field between the laevo-rotatory and dextro-rotatory components of the light beam which results in a change of inclination proportional to the magnetic field of the ellipse of the outcoming elliptically polarized beam. The elliptically polarized light beam emerging from the Faraday rotator thus containing data relative to the strength of the electric field as a function of the eccentricity of the ellipse and data relative to the strength of the magnetic field as a function of its inclination is then passed through a polarization type beam splitter such as a Wollaston prism which divides the light beam into two partial beams having different polarization directions, these partial beams then being passed respectively to photo-electric detectors which produce electrical intensities and which are then electrically substrated to produce an output current proportional to the product of the voltage on, and current flow in, the high voltage line at the point at which the instantaneous power level is measured.

3,675,126
COMMUTATED MOTOR SPEED MEASURING MEANS

Charles B. Chilton, Baltimore, Md., assignor to The Bendix Corporation

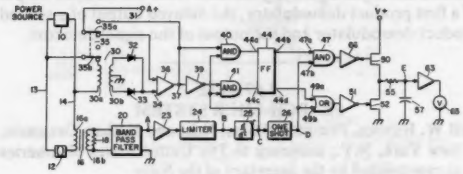
Filed Oct. 29, 1970, Ser. No. 85,012

Int. Cl. G01p *3/48*

U.S. Cl. 324—168 **10 Claims**

A device for measuring the speed of a commutated electric motor such as a d-c or universal motor uses a current trans-

former and band-pass filter for sensing power line perturbations caused by motor commutation. The sensed perturbations trigger a one-shot whose ON time with respect to total time is taken as a measure of motor speed. When a universal motor is powered by an a-c power source, a synchronous gating circuit is used to blank the measuring circuit near the zero crossings of the power line. A full wave level detector senses when instantaneous line voltage drops below a preset threshold level and at that time qualifies the synchronous gating circuit. The gating circuit is not actually opened, however, until a subsequent perturbation is detected, at which time motor speed measurement is suspended. When instantaneous line voltage now rises above the threshold level, the synchronous gating circuit is qualified to close but will not close until a second subsequent power line perturbation is detected.

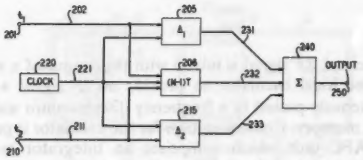


3,675,127

GATED-CLOCK TIME MEASUREMENT APPARATUS INCLUDING GRANULARITY ERROR ELIMINATION

Dennis Lester McKiernan, Lincoln Park, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 28, 1970, Ser. No. 101,477
Int. Cl. G04f 9/00, 11/06
U.S. Cl. 324—186 **4 Claims**



A precise measure of the time interval between the occurrence of first and second events is obtained by utilizing gated-clock time interval measurement apparatus. A plurality of clock pulses occurring during the interval between the events is counted. Errors in the time interval measurement are minimized by obtaining a measure of an interval between the first event and the first counted clock pulse and by obtaining a measure of an interval between the last counted clock pulse and the second event. Analog signals representative of the error intervals and the clock pulse count are combined to yield the desired time interval measurement.

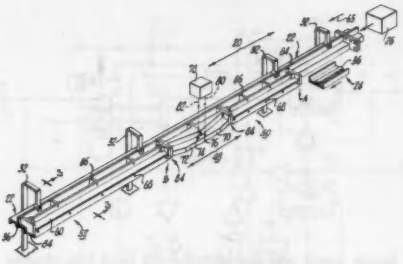
3,675,128

MICROWAVE REPEATER

Manlio G. Abele, Garden City, N.Y., assignor to General Applied Science Laboratories, Inc., Westbury, N.Y.

Filed July 30, 1970, Ser. No. 59,601
Int. Cl. H04n 3/36, 3/60
U.S. Cl. 325—1 **17 Claims**

A repeater for a stationary waveguide in a system for communicating between the waveguide and a moving vehicle such as a train. The stationary waveguide structure includes an inverted channel-shaped shield with a semi-cylindrical dielectric rod which acts as the waveguide. The shield protects the waveguide from ice, rain, birds and foreign objects, without itself interferring with the transmission of microwave energy through the waveguide. A coupler or antenna is attached to the moving vehicle and moves along underneath the stationary waveguide structure to couple signals between the vehicle and the stationary waveguide. The repeater comprises two short auxiliary sections of waveguides which are mounted parallel to the stationary waveguide, and a microwave amplifier. The first auxiliary waveguide removes a small portion of the signal flowing in the main waveguide and conducts that signal to the amplifier. The amplifier amplifies the signal and delivers it to the second waveguide which couples the energy back to the main waveguide in amplified form. By means of this repeater, the energy in the main waveguide is amplified substantially without interrupting the signal received by or transmitted by the moving vehicle.

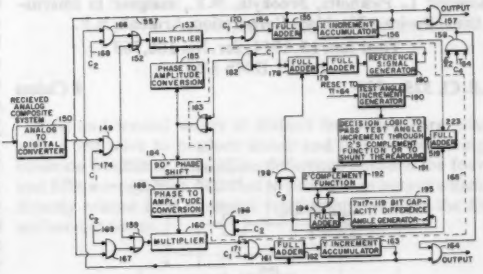


3,675,129

DIFFERENTIALLY COHERENT PHASE SHIFT KEYED DIGITAL DEMODULATING APPARATUS

William J. Melvin, Costa Mesa, Calif., assignor to Collins Radio Company, Cedar Rapids, Iowa

Filed May 13, 1970, Ser. No. 36,742
Int. Cl. H04l 27/22
U.S. Cl. 325—320 **13 Claims**

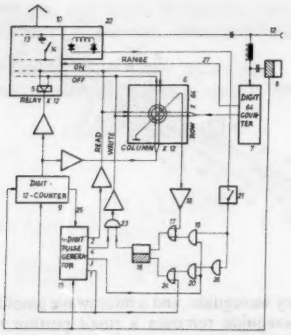


A digitally implemented demodulating system for use in detecting a multitone differentially coherent phase shift keyed received signal. A plurality of reference tones are sequentially generated and separated into in-phase and quad-phase components. These components are multiplied by the input signal and stored in a plurality of accumulators equal to twice the number of received tones to obtain the X and Y components of each received tone. Substantially the same circuitry is then used to measure the phase of each received tone with respect to a test angle after which the reference is updated to have the same phase as the received tone in preparation for the next detection operation. Recovery of the detection information is obtained by testing the polarity of the X and Y accumulators.

3,675,130
A CIRCUIT ARRANGEMENT FOR EFFECTING A TUNING OF A TRANSCEIVER BY MEANS OF A MANGETIC CORE MEMORY

Paul Bamberg, Pforzheim, Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Sept. 18, 1970, Ser. No. 73,285
Int. Cl. H04b 1/04
U.S. Cl. 325—174 **8 Claims**

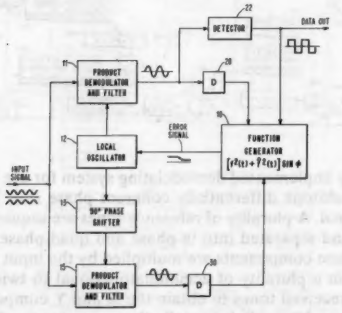


There is provided a remotely controlled antenna tuning device comprising a conventional magnetic core memory having the same number of rows as associated tuning steps of the transceiver and the same number of columns as antenna tuning elements (capacitors) connected by means of relays to the tuning circuit. The output signals of a first counter controlled by pulses generated while tuning the transceiver step by step, selects the corresponding row of the memory, in the columns of which is stored the information to activate the relays. The information may be stored in the memory or written in, respectively, by means of a tuning discriminator and a logic circuitry controlling a second counter and a pulse generator.

3,675,131
COHERENT SINGLE SIDEBAND PHASE LOCKING TECHNIQUE

Raymond L. Pickholtz, Brookyln, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 15, 1971, Ser. No. 106,763
Int. Cl. H04b 1/68
U.S. Cl. 325—329 **8 Claims**

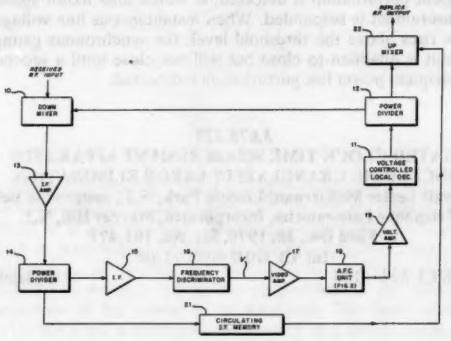


A phase-locked loop system capable of producing a synchronous reference of the proper frequency and phase to coincide with the frequency and phase of a transmitted single sideband modulated signal in order to properly demodulate the received signal for baseband recovery of the data. The invention makes use of post detection feedback to generate an error signal for locking a voltage control oscillator (VCO) to the correct phase for synchronous demodulation without using a transmitted carrier tone. The error signal which is equal to the sum of the baseband data waveform squared, plus the Hilbert transform of the baseband data waveform squared, times the sine of the phase difference between the VCO output and the input signal is generated from the delayed output of a first product demodulator, the delayed output of a second product demodulator and the output of the signal detector.

3,675,132
SEARCH-LOCK SYSTEM

Neil W. Hansen, Pompton Plains, N.J., and Nathan Orenstein, New York, N.Y., assignors to The United States of America as represented by the Secretary of the Navy

Filed Aug. 31, 1970, Ser. No. 68,581
Int. Cl. H04b 1/26
U.S. Cl. 325—423 **8 Claims**



A received RF signal is mixed with the output of a voltage-controlled local oscillator to provide an IF signal which is simultaneously passed to a frequency discriminator and a circulating memory. Control voltage for the oscillator is provided by an AFC unit which comprises an integrator receiving selected constant voltage inputs. During the search mode a search ramp is generated by the integrator. A flyback circuit causes the search voltage to repeat its traverse over a prescribed range. Bipolar video discriminator outputs above a predetermined threshold place the system in the lock mode and selectively gate two settable, constant voltage inputs to furnish a triangle wave integrator output centered on a voltage corresponding to the desired local oscillator frequency. The oscillator output is mixed with the stored IF to produce a replica of the input signal.

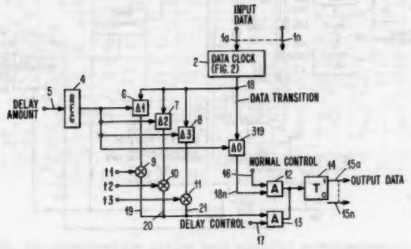
3,675,133
APPARATUS AND METHOD INDEPENDENTLY VARYING THE WIDTHS OF A PLURALITY OF PULSES

Richard F. Frankeny, and Joey K. Tuttle, both of Longmont, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 21, 1971, Ser. No. 155,091
Int. Cl. H03k 5/159, 17/26
U.S. Cl. 328—55 **13 Claims**

Input data comprises a plurality of serial random-width pulses each having a leading and a trailing edge. The relative position of each leading and trailing edge is independently adjustable in accordance with external data to give output data comprising a plurality of serial pulses derived from, but selectively

different than, the input data. A data clock generates a transition signal for each pulse edge. Each transition signal is directed into a different variable delay circuit which imposes a delay dictated by external data. The delayed transitions



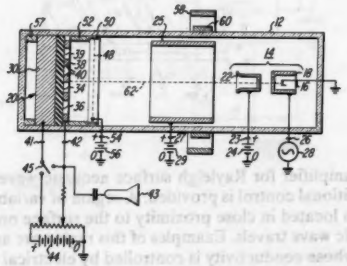
operate a pulse regenerating flip-flop to form the output data. Appropriate gating controls permit width control of only selected pulses. By defining normal data as delayed input data, output data may be shifted either forward or backward in time relative to the normal data.

3,675,134

METHOD OF OPERATING AN INFORMATION STORAGE TUBE

Eduard Luedicke, Neshanic, and Robert Steven Silver, Kendall Park, both of N.J., assignors to RCA Corporation

Filed May 27, 1971, Ser. No. 147,391
Int. Cl. G11c *11/26*
U.S. Cl. 328—124 **10 Claims**



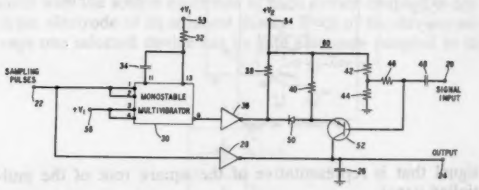
In the operation of an information storage tube including a storage target, comprising a conducting or semiconductor substrate, an insulating storage layer and a conducting grid or mesh, means for scanning the target with an electron beam, and a secondary electron collector adjacent to the target; the storage target is primed by scanning the target with a low velocity beam in a series of steps while maintaining the conducting grid at a low positive potential (e.g., +5 volts) and applying successively higher positive potentials to the substrate, until the difference between the potentials of the substrate and the conducting mesh is about 25 volts, and then reducing the substrate potential enough to reduce the storage layer potential to zero, preparatory to writing. Now, the signal information can be (1) stored on the storage layer, by scanning the target with a high velocity writing beam; (2) read out nondestructively, by scanning the target with a low velocity reading beam; and (3) erased, by scanning the target with a high velocity erasing beam.

3,675,135

SAMPLE-AND-HOLD CIRCUIT

David Reis Weller, Bernardsville, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed July 27, 1970, Ser. No. 58,229
Int. Cl. H03k *17/56*
U.S. Cl. 328—151 **5 Claims**



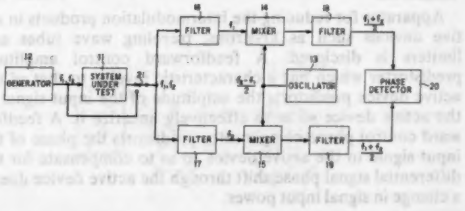
A sample-and-hold circuit wherein the input signal to be sampled controls a current switch that supplies a linear charging current to a storage device in response to periodic sampling pulses. The storage device is completely discharged immediately preceding the taking of each sample.

3,675,136

APPARATUS FOR USE IN MEASURING PHASE DISPERSION PRODUCED BY APPARATUS OR A SYSTEM

Kevin Christopher O'Brien, Parsippany, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed April 1, 1971, Ser. No. 130,204
Int. Cl. G01r *25/00*
U.S. Cl. 328—133 **2 Claims**



First and second waves at distinct frequencies are mixed with a 3rd wave to produce fourth and fifth waves having a common frequency. The phase difference between the fourth and fifth waves is then detected to produce an output which is directly related to the phaseal relationship between the first and second waves.

3,675,137

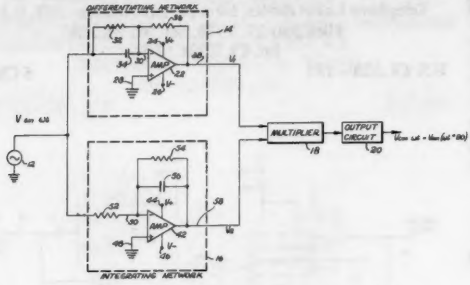
INSTANTANEOUS SINUSOIDAL ORTHOGONAL CONVERTER

Leon Raphael, 23816 Calvert St., Woodland Hills, Calif.

Filed April 5, 1971, Ser. No. 131,208
Int. Cl. G06g *7/20*
U.S. Cl. 328—144 **6 Claims**

A system for instantaneously providing a predetermined phase shift in a sinusoidal signal, the attenuation of which is substantially constant with changes in the frequency of the applied signal. First, phase displacement between two developed signals is accomplished by supplying an input signal both to: a differentiating network and an integrating network. Next, the phase displaced signals are multiplied to cancel the variations in attenuation providing a signal that is substantially invariable

with frequency variations and is phase displaced from the initial input signal. As disclosed, a root circuit may provide a



signal that is representative of the square root of the multiplied signal.

3,675,138

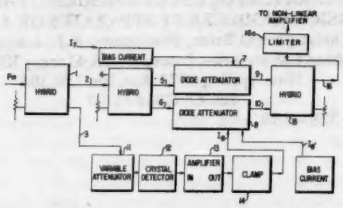
REDUCTION OF INTERMODULATION PRODUCTS

Arthur F. Standing, Rockville, Md., assignor to Communications Satellite Corporation

Filed Sept. 23, 1970, Ser. No. 74,567

Int. Cl. H03b *1/00*

U.S. Cl. 328—163 **32 Claims**



Apparatus for reducing the intermodulation products in active devices such as klystrons, traveling wave tubes and limiters is disclosed. A feedforward control amplitude predistorter which has a characteristic inverse to that of the active device predistorts the amplitude of the input signal to the active device so as to effectively linearize it. A feedforward control phase compensator predistorts the phase of the input signal to the active device so as to compensate for the differential signal phase shift through the active device due to a change in signal input power.

3,675,139

ELECTRICAL DEMODULATION SYSTEMS

Ashley W. Guest, Waterlooville, England, assignor to Plessey Handel Und Investments A.G., Zug, Switzerland

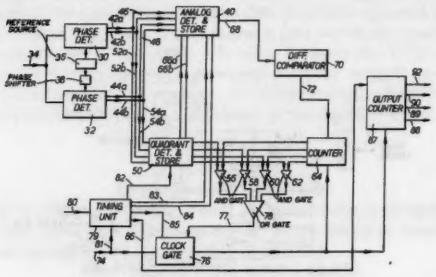
Filed Jan. 11, 1971, Ser. No. 105,577

Claims priority, application Great Britain, Jan. 14, 1970, 1,731/70

Int. Cl. H04l *27/22*

U.S. Cl. 329—104 **16 Claims**

The system demodulates an input signal in which the data carried in each of successive periods is represented by the phase of the signal during that period with respect to the phase in the preceding period. Two phase detectors respectively produce outputs whose signs are dependent on the phase difference between the input carrier and a phase reference and between the input carrier and the phase reference displaced by 90°. From these outputs, a quadrant detector determines a serial number identifying the phase quadrant in which the input carrier vector lies. A ring counter is stepped to equal this count. The process is repeated during the next period and the counter is re-stepped to match the new count. The number of counts necessary in this re-stepping process is measured by an output counter whose final count identifies the value of the data in the second period. During each period an analogue unit measures the angle of the input vector relative to the



beginning of its quadrant, and a comparator increases the count of the ring counter by unity if the angle of the input vector during one period is less than the corresponding angle in the previous period, and thus compensates for noise effects.

3,675,140

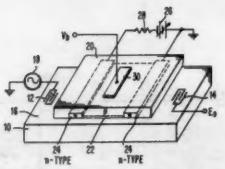
ACOUSTIC WAVE AMPLIFIER HAVING A COUPLED SEMICONDUCTOR LAYER

Frank F. Fang, Yorktown Heights, and Eric G. Lean, Mahopac, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 30, 1970, Ser. No. 51,286

Int. Cl. H03f *3/04*

U.S. Cl. 330—5.5 **15 Claims**



An amplifier for Rayleigh surface acoustic waves in which an additional control is provided. A region of variable conductivity is located in close proximity to the surface on which the acoustic wave travels. Examples of this region are an inversion layer whose conductivity is controlled by electrical bias, and a bulk region whose conductivity is controlled by a variable width depletion region. The electric field produced by moving charge carriers in the variable conductivity region interacts with the piezoelectric field produced by the acoustic wave to transfer energy to the acoustic wave, or extract energy from this wave.

3,675,141

MODULAR SOLID-STATE POWER AMPLIFIER

Robert H. Adams, Sun Valley, Calif., assignor to Lockheed Aircraft Corporation, Burbank, Calif.

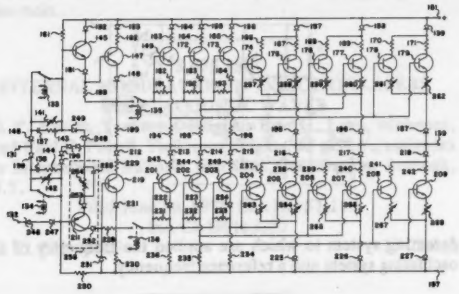
Continuation-in-part of Ser. No. 835,344, June 23, 1969, Pat. No. 3,569,847. This application March 8, 1971, Ser. No. 121,711

Int. Cl. H03f *3/18*

U.S. Cl. 330—13 **10 Claims**

A modular solid-state amplifier capable of delivering several kilowatts of audio-frequency power over a frequency range of 0 to approximately 7,500 hertz and which has an output impedance selectively variable from substantially zero to

approximately 100,000 ohms. The amplifier modules may readily be combined to obtain either voltage or current gain,

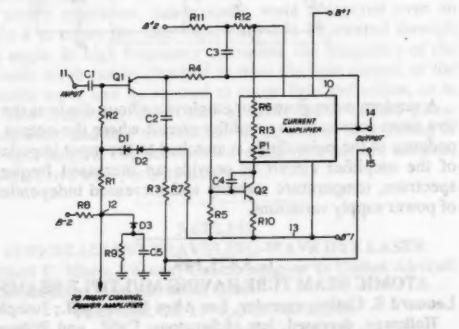


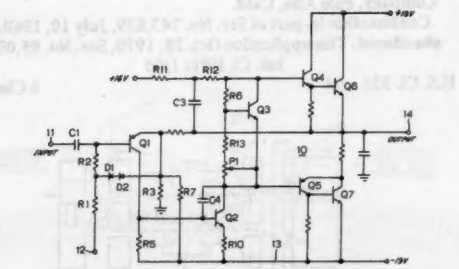
or both, by appropriate series and parallel arrangements, or combinations thereof.

3,675,142
TRANSISTOR POWER AMPLIFIER WITH DC OUTPUT VOLTAGE STABILIZATION

Roland H. Fichtner, Ontario, Canada, assignor to Electrohome Limited, Kitchener, Ontario, Canada

Filed March 5, 1971, Ser. No. 121,473
Int. Cl. H03f 3/18, 3/04
U.S. Cl. 330—17 **9 Claims**





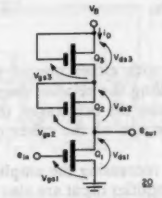
A transistor power amplifier comprises a voltage amplifier DC coupled with a current amplifier and provided with a network that inhibits the flow of DC current through the voice coil of a loudspeaker connected between the output terminals of the amplifier.

3,675,143
ALL-FET LINEAR VOLTAGE AMPLIFIER

Richard M. Greene, Smithtown, N.Y., assignor to GTE Laboratories Incorporated

Filed Feb. 16, 1970, Ser. No. 11,599
Int. Cl. H03f 3/16
U.S. Cl. 330—18 **9 Claims**

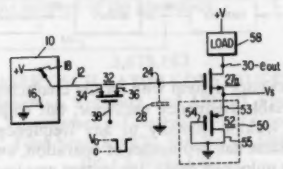
A linear voltage amplifier circuit which utilizes a plurality of field-effect devices having substantially identical operating characteristics. The devices are connected in a series arrangement with the source electrode of each device coupled to the drain electrode of its adjacent device. Each of the devices except one selected device has its gate electrode coupled to its drain electrode. An input terminal is coupled to the gate electrode of the selected device and an output terminal is connected to the drain electrode of one of the devices. In a preferred embodiment of the invention the gain of the amplifier is $-(n-1)$ where n equals the number of devices in the series arrangement.



3,675,144
TRANSMISSION GATE AND BIASING CIRCUITS

Borys Zuk, Somerville, N.J., assignor to RCA Corporation

Filed Sept. 4, 1969, Ser. No. 855,167
Int. Cl. H03f 3/04
U.S. Cl. 330—40 **26 Claims**



A single transistor transmission gate coupled at the output end of its conduction channel to a circuit input terminal. When operating in the following mode, the undesired effect of the offset voltage which develops at said output end of said channel, due to the threshold voltage of the transmission gate, is counteracted by reverse biasing, the circuit being driven by a voltage similar to the offset voltage. Shift register employing this circuit and means for changing one of the levels of the output voltage produced by this circuit are also described.

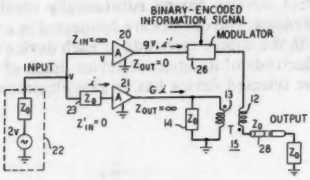
3,675,145
AMPLIFIER WITH MATCHED INPUT AND OUTPUT

Henry Richard Beurrier, Chester Township, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed March 22, 1971, Ser. No. 126,683
Int. Cl. H03f 3/68
U.S. Cl. 330—124 R **15 Claims**

This application describes an arrangement for matching the output impedance of an amplifier to its load. The amplifier comprises two active stages having mutually inverse output impedances whose respective magnitudes are, preferably, at

least an order of magnitude greater than and at least an order of magnitude less than the impedance of the external load circuit to which the amplifier is connected. The lower output impedance stage is connected to a first load impedance through one winding of a two-winding transformer. The higher output impedance stage is connected to ground through the other transformer winding. A second, impedance-matching load is



connected in shunt with either one of the two transformer windings. By controlling the relative amplitude and phase of the signals derived from the two stages, the signal current can be coupled to either one or the other of the two load impedances, or to both.

Arrangements for increasing the amplifier gain and obtaining a match at the amplifier input are also described.

3,675,146

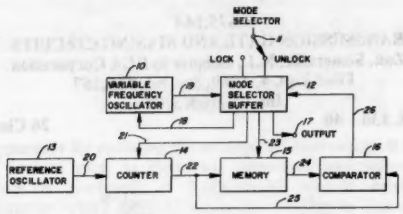
DIGITAL VARIABLE FREQUENCY OSCILLATOR

J. Michael Langham, 16 W. 525 Lake Drive N., Clarendon Hills, Ill.

Filed March 8, 1971, Ser. No. 121,837

Int. Cl. H03b *3/04*

U.S. Cl. 331—1 R **14 Claims**



A plural oscillator system with all the characteristics of an analog or variable frequency oscillator, but with the added capability of locking digitally to any frequency within its range. The system has two modes of operation, unlocked and locked. In the unlocked mode, the system employs a variable frequency oscillator together with a reference oscillator and counter to produce the system output and to log the period of the variable frequency oscillator into a memory. In the locked mode, the contents of the memory are held constant, and the variable frequency oscillator no longer drives the system output. Instead, the reference oscillator and counter are used in conjunction with a digital comparator to produce the system output with a frequency determined by the contents of the memory. Thus, the system in the locked mode operates as a digital oscillator at the frequency that the variable frequency oscillator operated before the mode change.

3,675,147

CIRCUIT FOR REGULATING THE MEAN FREQUENCY OF AN OSCILLATING SYSTEM

Jean Claude Berney, Lausanne, Switzerland, assignor to Compagnie des Montres Longines, Francillon S.A., Bern, Switzerland

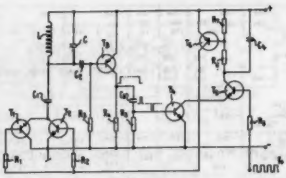
Filed May 5, 1970, Ser. No. 34,733

Claims priority, application Switzerland, May 8, 1969, 7066/69

Int. Cl. H03b *3/04*

U.S. Cl. 331—8 **2 Claims**

A circuit for regulating the mean frequency of an oscillating system by temporarily connecting a capacity to said oscillating system by means of an electronic switch controlled by a phase-



detecting system to which are applied the frequency of said oscillating system and a reference frequency.

3,675,148

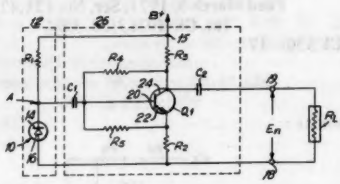
RANDOM NOISE GENERATOR DIODE WITH IMPEDANCE MATCHED TRANSISTOR AMPLIFIER

Lon E. Edwards, Danbury, Conn., assignor to Solitron Devices, Inc., Tappan, N.Y.

Filed June 6, 1969, Ser. No. 830,939

Int. Cl. H03b *29/00*

U.S. Cl. 331—78 **6 Claims**



A random noise generator employs a silicon diode as the active noise source in an amplifier circuit where the output impedance of the noise diode is matched to the input impedance of the amplifier circuit to provide an increased frequency spectrum, temperature stability and increased independence of power supply variations.

3,675,149

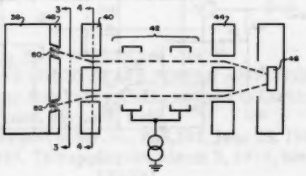
ATOMIC BEAM TUBE HAVING MULTIPLE BEAMS

Leonard S. Cutler, executor, Los Altos Hills, Calif.; Joseph H. Holloway, deceased, late of Saratoga, Calif., and Wilson R. Turner, Los Gatos, Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation-in-part of Ser. No. 743,839, July 10, 1968, abandoned. This application Oct. 29, 1970, Ser. No. 85,092

Int. Cl. H01s *1/06*

U.S. Cl. 331—94 **6 Claims**



An atomic beam tube produces a plurality of atomic beams, all of which are passed through a pair of R.F. cavities and then detected by a single detector. First and second state-selecting magnets are configured with a plurality of deflecting gaps, each of which produces an inhomogeneous magnetic field.

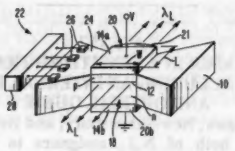
The deflecting gaps are arranged in symmetrical pairs to provide a beam tube having a high tolerance to acceleration forces. The use of multiple beams provides a high signal-to-noise ratio.

3,675,150

INTERNAL MODULATION OF INJECTION LASERS USING ACOUSTIC WAVES

Erik P. Harris, Yorktown Heights; Eric G. Lean, Mahopac, and Carl G. Powell, Yorktown Heights, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 30, 1970, Ser. No. 51,110
Int. Cl. H01s 3/00
U.S. Cl. 331—94.5 17 Claims



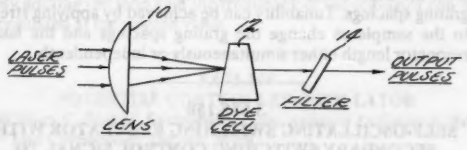
An injection laser whose light output is spatially modulated by internal effects in the active region of the laser. An acoustic wave is launched into the laser and is existent only in a small area including the active region of the laser. In low acoustic frequency operation, the acoustic wave is steered over an angle θ to cause the laser light output to be steered through this angle. In high frequency operation, the frequency of the acoustic wave can be changed to steer the light output, or the acoustic wave can be steered to cause light deflection, as in the low frequency case. The acoustic wave causes phase modulation and loss modulation which results in scanning of the light output. The acoustic wave can be a surface acoustic wave, a Love wave, or a Stonley wave.

3,675,151

SUPERRADIANT TRAVELING-WAVE DYE LASER

Michael E. Mack, Vernon, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed Sept. 25, 1970, Ser. No. 75,636
Int. Cl. H01s 3/00
U.S. Cl. 331—94.5 7 Claims



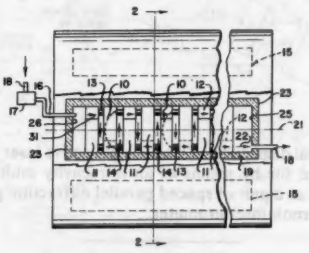
Superradiant traveling-wave laser emission is produced with polymethine cyanine dyes pumped by mode-locked or Q-switched laser pulses without the necessity of a feedback cavity for the dye. Picosecond duration laser pulses may be produced at a variety of wavelengths by choosing the proper dye and the pumping laser wavelength.

3,675,152

COMPENSATOR FOR A RADIAL REFRACTIVE-INDEX GRADIENT IN A DISC LASER

Charles Gilbert Young, Storrs, Conn., assignor to American Optical Corporation, Southbridge, Mass.

Continuation-in-part of Ser. No. 20,946, March 19, 1970, Pat. No. 3,602,836. This application June 24, 1970, Ser. No. 49,263
Int. Cl. H01s 3/00
U.S. Cl. 331—94.5 12 Claims



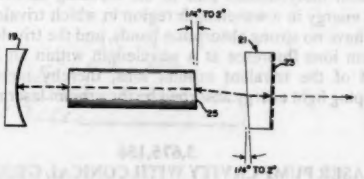
A disc laser structure of all-glass support construction. A segmented neodymium-doped glass laser rod is supported in a glass tubing and is designed to permit fluid coolant flow within the tubing and amongst the rod segments. The non-laserable glass supporting means consists of samarium-doped cladding glass to reduce interference by "off axis" spontaneously emitted light. The fluid coolant has an index of refraction which matches that of the laser glass to achieve a high efficiency. The absence of metallic supporting means minimizes the chance of metallic decomposition under the influence of pump light. Compensation for a radial refractive index gradient is provided by figuring (creating a non-zero optical power in) one or more of the glass discs.

3,675,153

LASER OSCILLATOR CONSTRUCTION

Orville B. Bakeman, Syracuse, and Allen D. French, Manlius, both of N.Y., assignors to General Electric Company

Filed Sept. 1, 1970, Ser. No. 68,606
Int. Cl. H01s 3/00
U.S. Cl. 331—94.5 4 Claims

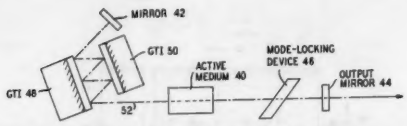


A laser oscillator (Fabry-Perot) cavity configuration supporting only the primary oscillation with no inner loop parallel planes capable of supporting secondary oscillations which cause hot spots in the laser beam. Such configuration is accomplished by angling the output end surface of the laser rod, or both end surfaces of the rod in severe cases, slightly off the perpendicular to the rod axis.

3,675,154
DISPERSION COMPENSATION IN LASERS

Michel Albert Duguay, Summit, and John Wilfred Hansen, North Plainfield, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Oct. 1, 1970, Ser. No. 77,228
Int. Cl. H01S 3/00; G01b 9/02
U.S. Cl. 331—94.5 12 Claims

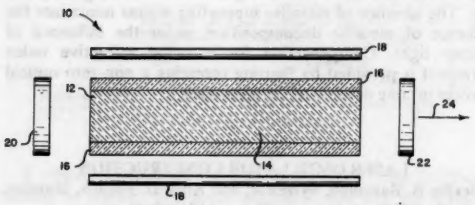


The normal dispersion of a solid state active laser medium is compensated for by means of an intracavity multireflection device such as a pair of spaced parallel diffraction gratings or a Gires-Tournois interferometer.

3,675,155
SENSITIZING LUMINESCENCE OF ERBIUM WITH MOLYBDENUM

Robert J. Landry, Sturbridge, and Elias Snitzer, Wellesley, both of Mass., assignors to American Optical Corporation, Southbridge, Mass.

Filed Nov. 3, 1970, Ser. No. 86,572
Int. Cl. H01s 3/00
U.S. Cl. 331—94.5 7 Claims



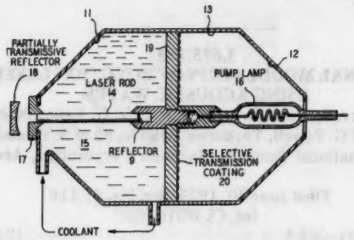
The luminescence of an erbium or erbium-ytterbium doped glass laser rod is sensitized by surrounding the laser rod with a glass cladding containing trivalent molybdenum ions. The trivalent molybdenum ions in the cladding absorb pumping light energy in a wavelength region in which trivalent erbium ions have no strong absorption bands, and the trivalent molybdenum ions fluoresce at a wavelength within an absorption band of the trivalent erbium ions, thereby increasing the pumping light energy absorbed by the erbium laser rod.

3,675,156
LASER PUMP CAVITY WITH CONICAL GEOMETRY

Hans Guenter Danielmeyer, Matawan, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Feb. 25, 1971, Ser. No. 118,772
Int. Cl. H01s 3/09
U.S. Cl. 331—94.5 4 Claims

There is disclosed an optically pumped laser employing a pump cavity including two facing internally reflective conical elements within which an elongated laser element and an elongated pump lamp are respectively axially oriented. Typically, an internally-reflective cylindrical element connects the two conical elements. As compared to prior pump cavities, this

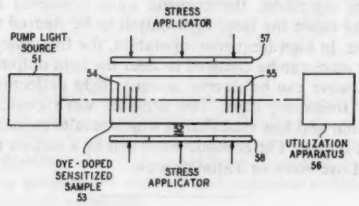


cavity provides superior fundamental transverse mode operation and simplified fabrication.

3,675,157
TUNABLE LASER IN A SENSITIZED TRANSPARENT MATERIAL INCLUDING AN INTERNAL RESONATOR AND OPTICAL GUIDE

Ivan Paul Kaminow, New Shrewsbury, and Heinz Paul Weber, Middletown, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed April 27, 1971, Ser. No. 137,866
Int. Cl. H01s 3/16
U.S. Cl. 331—94.5 12 Claims



There is disclosed a compact, narrow-band single frequency laser employing a pair of internal grating reflectors photo-induced in a suitably sensitized transparent material doped with an active medium. Specifically, a laser is obtained in a photosensitized sample of dye-doped poly(methyl methacrylate). It includes an internal resonator formed by a pair of grating reflectors permanently induced in the sample, in which optical guides can also be induced upon exposure to ultraviolet radiation. The resonated laser frequency is selected from the usual broad dye emission spectrum by choice of the grating spacings. Tunability can be achieved by applying stress to the sample to change the grating spacings and the laser resonator length either simultaneously or independently.

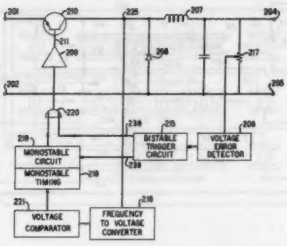
3,675,158
SELF-OSCILLATING SWITCHING REGULATOR WITH SECONDARY SWITCHING CONTROL SIGNAL TO REGULATE SWITCHING FREQUENCY

Frank Fuller Judd, Madison, and Helmut Wilhart, Whippany, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Dec. 21, 1970, Ser. No. 100,147
Int. Cl. G05f 1/40; H03b 3/04
U.S. Cl. 331—109 6 Claims

A self-oscillating switching regulator is frequency regulated by the introduction of secondary switching control signals into

the voltage regulation feedback loop to delay switching of the switching device. The secondary switching control signal comprises a variable duration pulse signal. This pulse signal is tacked onto the trailing edge of the conventional switching control signal and hence extends the duration of the control signal applied to the switching device. The switching delay introduced by the secondary control signal directly regulates the switching frequency of the switching regulator.

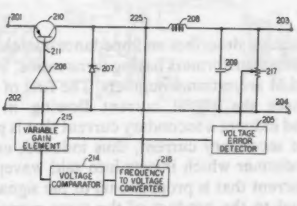


3,675,159

SELF-OSCILLATING SWITCHING REGULATOR WITH FREQUENCY RESPONSIVE FEEDBACK LOOP GAIN CONTROL

Frank Fuller Judd, Madison; Jan Mark Lieberman, Lake Hiawatha, and Helmut Wilhart, Whippany, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Dec. 21, 1970, Ser. No. 100,149
Int. Cl. G05f 1/44; H03b 3/02
U.S. Cl. 331—109 **5 Claims**



A self-oscillating switching mode regulator includes circuitry to automatically control the gain of voltage feedback loop. The gain circuitry is responsive to the deviations of the switching frequency of the regulator from some desired value. By altering the loop gain the frequency of the regulator can be regulated at the desired value.

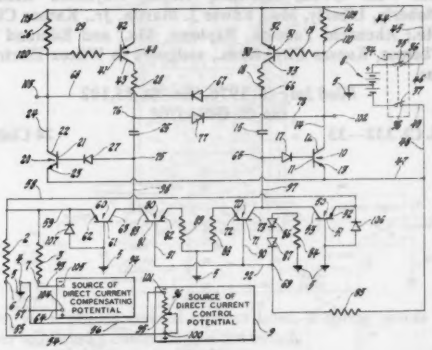
3,675,160

POTENTIAL CONTROLLED OSCILLATOR

William C. Staker, Springfield, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 31, 1970, Ser. No. 68,068
Int. Cl. H03k 3/282
U.S. Cl. 331—113 R **6 Claims**

A potential controlled oscillator including two transistors interconnected for alternate conduction, each corresponding to a respective timing capacitor, having the current carrying electrodes thereof connected in parallel across the output terminals of a direct current potential source. Each timing capacitor is charged in a first direction by the direct current potential source through the base-emitter electrodes of the corresponding transistor when conductive and in a second direction by a selectively variable direct current control potential through a constant current circuit responsive to the magnitude of the selectively variable direct current control potential for varying the magnitude of charge current and the collector-emitter electrodes of the other transistor when conductive. When either timing capacitor has become charged in the second direction, the selectively variable direct current control potential, applied across the base-emitter electrodes of the corresponding transistor, triggers the corresponding transistor conductive. Upon the triggering of either one of the transistors conductive, the other timing capacitor, charged in the first direction, discharges therethrough in an inverse polarity relationship across the base-emitter electrodes of the corresponding transistor to quickly extinguish the corresponding transistor and begins to charge therethrough in the second direction.

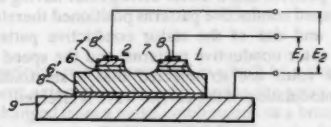


3,675,161

VARACTOR-CONTROLLED PN JUNCTION SEMICONDUCTOR MICROWAVE OSCILLATION DEVICE

Iwao Teramoto, Ibaragi-shi; Hitoo Iwasa, Takatsuki-shi; Yukio Miyai, Osaka, and Masumi Takeshima, Takatsuki-shi, all of Japan, assignors to Matsushita Electronics Corporation, Osaka, Japan

Filed Oct. 8, 1969, Ser. No. 864,684
Claims priority, application Japan, Oct. 12, 1968, 43/74739
Int. Cl. H03c 3/22
U.S. Cl. 332—16 R **10 Claims**



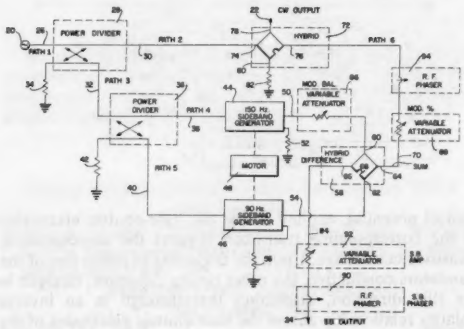
A solid state microwave generating device comprising a 3-terminal element having a p-n junction representing a negative resistance and a junction of which the junction capacitance is varied according to a voltage applied thereto. A reverse voltage is imparted to said p-n junction so that the latter is maintained in a negative resistance condition resulting from an avalanche current. The other junction is set to a suitable reactance value so as to produce a microwave of a tuned wavelength, and under such a condition a modulating signal is supplied in superimposition to said other junction to thereby

change the reactance value thereof, thus effecting microwave modulation. With this device, the oscillation wave occurring in a resonator circuit is controlled in accordance with lumped constants so that the tuning operation of the resonant circuit, modulation (FM), automatic frequency control (AFC) and so forth can be easily and efficiently performed.

3,675,162
MODULATOR FOR INSTRUMENT LANDING SYSTEM

James Neal Owen, Shawnee, Kans.; Raymond Ronald Moberly, Liberty, Mo.; Edwin J. Martin, Jr., Kansas City, Mo.; Akemichi Yamada, Raytown, Mo., and Edmund C. Thomas, Kansas City, Kans., assignors to Wilcox Electric, Inc.

Filed July 15, 1970, Ser. No. 55,102
Int. Cl. G01s *1/08*
U.S. Cl. 332—23 **24 Claims**



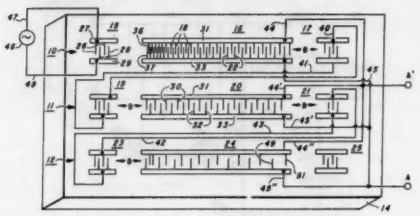
A modulator for an instrument landing system includes a source of a radio frequency carrier wave and a first power divider coupling the carrier wave to a first hybrid combining circuit and through a second power divider to first and second constant input impedance audio frequency double sideband suppressed carrier generators with good isolation. The sideband generators are coupled to a second hybrid combining network having a double sideband suppressed carrier difference signal output, constituting a "sideband" output of the modulator, and a double sideband suppressed carrier sum output which is combined with the carrier wave in the first hybrid combining circuit to provide a "carrier wave" output of the modulator. The sideband generators each include a capacitor bridge, and phase shift means are provided so that the signals on one side of the bridge are reversed in phase with respect to signals on the other side thereof. The bridges are each formed by a pair of spaced parallel stator plates having four facing conductive patterns and a motor driven rotor having a plurality of pie-shaped conductive patterns positioned therebetween. The shape and size of the stator conductive patterns, the number of rotor conductive patterns, and the speed of rotation of the rotor are so selected that a sinusoidal audio frequency modulation of the carrier wave is effected.

3,675,163
CASCADED F. M. CORRELATORS FOR LONG PULSES

Clinton S. Hartmann, 8923 Clearwater Drive, Dallas, Tex., and William S. Jones, 427 Beverly Drive, Richardson, Tex.

Filed Aug. 26, 1970, Ser. No. 67,017
Int. Cl. H03h *7/30, 9/30*
U.S. Cl. 333—30 R **9 Claims**

Methods and apparatus are disclosed for producing a frequency dispersive surface wave delay device or correlator having a large time bandwidth product. The device comprises several sections, each of which contributes a discrete frequency dispersive delay to the incident signal. These sections are cascaded together and the individual delays are additive producing a device having a large time bandwidth product. Each section comprises at least two interdigital surface wave transducers deposited on a piezoelectric substrate, at least one

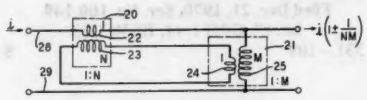


of the transducers having electrodes of graded periodicity. A Fourier transform computer program may be used to optimize the overall correlator characteristics by defining the optimum weighting pattern to be utilized on one or both of the transducers of each cascaded section.

3,675,164
IMPEDANCE-MATCHING NETWORK

Harold Seidel, Warren, N.J., assignor to Bell Telephone Laboratories, Incorporated, Berkeley Heights, N.J.

Filed Oct. 21, 1969, Ser. No. 868,017
Int. Cl. H03b *7/38*
U.S. Cl. 333—32 **6 Claims**



This application describes an impedance-matching network comprising two transformers having turns ratios, 1:N and 1:M, where N and M are rational numbers. The first of these transformers senses the signal current flowing in the signal wavepath and induces a secondary current that is proportional thereto. The secondary current, thus induced, energizes the second transformer which injects into said wavepath a component of current that is proportional to the signal current by a factor equal to the product of the turns ratios of the two transformers. When at least one of the two transformers is a two-winding transformer, the effective turns ratio of this network is given by $1:1 \pm 1/(NM)$, where the sign $(\pm)$ is determined by the manner in which the transformers are connected. When two, single-winding transformers, such as autotransformers, are used, the effective turns ratio is given by $1:[(N-1)/N \pm 1/MN]$.

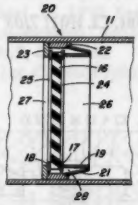
3,675,165
WAVEGUIDE WINDOW FOR TRANSMISSION OF ELECTROMAGNETIC WAVES

Isao Ueda; Takao Kageyama, and Isao Inomata, all of Tokyo, Japan, assignors to Nippon Electric Company, Limited, Tokyo, Japan

Filed Aug. 21, 1970, Ser. No. 66,040
Claims priority, application Japan, Sept. 1, 1969, 44/69148
Int. Cl. H01p *1/08, 1/30, 5/00*
U.S. Cl. 333—98 P **5 Claims**

A window for sealing a waveguide gas pressurized to transmit microwave signals comprising: a dielectric plate permeable to the microwave signals, and a mechanical structure hermetically sealing the dielectric plate in the interior of the

waveguide and including four openings dimensioned to provide the window with a substantially flat voltage standing wave ratio versus frequency characteristic over a predetermined frequency range, two relatively movable members to permit



the dielectric plate to move to compensate for unequal gas pressures on opposite surfaces thereof, and a space to allow movement of the two members to compensate for thermal expansion thereof due to microwave signal loss in the dielectric plate.

3,675,166

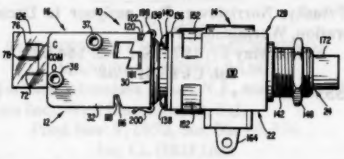
SWITCHING DEVICES

Fenimore G. McCloskey, and William Robert Jordan, Columbus, Ohio, assignors to Columbus Electric Manufacturing Co., Columbus, Ohio

Filed Sept. 16, 1970, Ser. No. 72,607

Int. Cl. H01h *9/20*

U.S. Cl. 335—164 **11 Claims**



A switching device of the electromechanical type including a push button actuator, a permanent magnet for keeping the actuator in the operated position, and an electromagnet which is energizable to neutralize the permanent magnet field and allow the actuator to return to its unoperated position.

3,675,167

SWITCH OVERLOAD

Jakob Ellenberger, Altdorf near Nuernberg, Germany, assignor to Ellenberger & Poensgen GmbH, Altdorf near Nuernberg, Germany

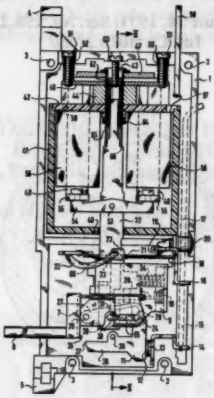
Filed Nov. 2, 1970, Ser. No. 85,845

Claims priority, application Germany, Nov. 4, 1969, P 19 55 306.1

Int. Cl. H01h *51/27*

U.S. Cl. 335—179 **17 Claims**

An overload switch having a core associated with a permanent magnet with two sets of limbs and armatures associated with each set connected by a lever. The sets of limbs are provided with windings which are wound so that a current in the windings increases the magnetic attraction in the case of one armature, but decreases it in the case of the other arma-



ture. At a predetermined current level, a spring pivots the lever to release a catch to open the switch.

3,675,168

ELECTRICAL RELAYS

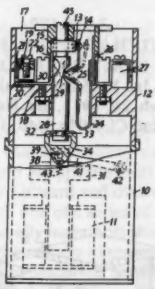
Norman Harry Olley, Essex, England, assignor to Mte-Contractor (Components) Limited, Essex, England, a part interest

Filed March 25, 1971, Ser. No. 127,964

Claims priority, application Great Britain, April 2, 1970, 15,694/70

Int. Cl. H01h *1/06*

U.S. Cl. 335—198 **4 Claims**

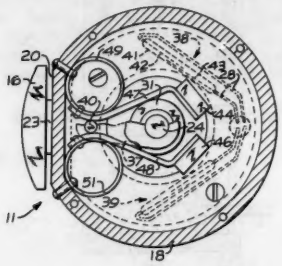


An electrical relay is provided in which by a simple manual adjustment external to the relay casing the pairs of contacts can be changed from a make combination to a break combination and vice versa. An operating member in the form of a circular rod is provided for each pair of contacts and is linearly movable on movement of the relay armature. Each rod is provided with two cams arranged at diametrically opposite positions on the rod and spaced apart a distance equal to the stroke of the armature. A spring carrying the moving contact of the pair has a cam follower which when the electromagnet is in one condition engages a cam and when the electromagnet is in the other condition engages the surface of the rod. Rotation of the rod through 180 degrees reverses the engagement of the cam and surface of the rod. The rods project a short distance beyond the casing and are slotted for screw-driver adjustment.

3,675,169
DURABLE ELECTRICAL SWITCH

Rolland D. Scholl, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed June 24, 1971, Ser. No. 156,228
Int. Cl. H01h 21/80
U.S. Cl. 335—205 9 Claims

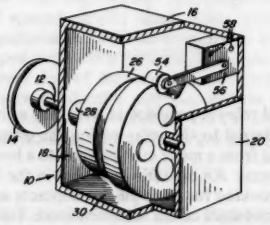


A manually operated switch having a sealed cylindrical housing is controlled through a pivotable, radially extending external actuator member and contains a pair of magnetically actuated sets of reed contacts for connection to the electrical circuit with which the switch is associated. A pair of permanent magnets are carried on resilient arms within the housing whereby each may be shifted into an operative position relative to one of the sets of reed contacts upon flexing of the associated arm. The external actuator member is disposed on an axle which extends into the housing through a circular seal and bearing to connect with a parallel internal actuator that bears against either of the resilient arms according to the direction of pivoting. This enables external actuator movement to be transmitted into the housing in the form of purely rotational motion through the circular seal thereby simplifying sealing problems and minimizing wear to provide a compact rugged and long lived mechanism.

3,675,170
MAGNETIC CLUTCH COUPLING FOR MONITORING SHAFT ROTATION

James W. Wellman, Jr., 1445 Brook Valley Place, Dallas, Tex.

Filed Feb. 26, 1971, Ser. No. 119,228
Int. Cl. H01h 3/40, 3/42
U.S. Cl. 335—207 10 Claims

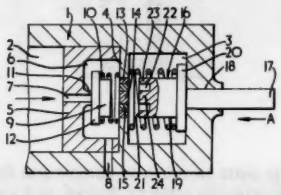


A wheel having permanent magnets therein is keyed to a rotatable shaft. A second wheel is positioned adjacent the first wheel and also includes a number of permanent magnets therein. The second mentioned wheel is driven by magnetic coupling when the shaft and the first mentioned wheel turns. Means are provided for sensing the rotation of the second or driven wheel which indicates direction of rotation for the shaft.

3,675,171
MAGNETICALLY OPERABLE DEVICE

Colin John Kirk, Crothorne, England, assignor to Martonair Limited, Twickenham, Middlesex, England

Filed Dec. 16, 1970, Ser. No. 98,649
Claims priority, application Great Britain, Jan. 15, 1970, 2,013/70
Int. Cl. H01f 7/08
U.S. Cl. 335—232 9 Claims

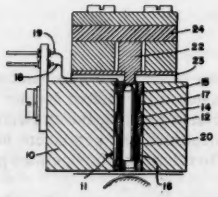


A magnetically operable valve or like device including a movable member and a fixed member, each including a magnetic material. The movable member is movable between positions remote from and adjacent the fixed member so that when the magnetic material of one of said members is magnetized and when said movable member is moved to a position adjacent the fixed member, a magnetic field is produced in the fixed member. The valve or like device also includes a movable magnetic element supported adjacent the side of the fixed member remote from the movable member and biased into an initial position from which it is movable by said magnetic field against the bias when the movable member is moved adjacent said fixed member.

3,675,172
DAMPING APPARATUS FOR A LINEAR ACTUATOR DEVICE

Neil J. Petusky, Norristown, Pa., assignor to Decision Data Corporation, Warminster, Pa.

Filed May 17, 1971, Ser. No. 144,084
Int. Cl. H01f 7/08
U.S. Cl. 335—257 15 Claims



A damping system used for controlling the rebound of actuator members used in high speed printers or the like is disclosed. The system involves the use of the principle that when masses collide in an elastic collision, the kinetic energy of the system remains constant. In the system, a secondary mass is free for limited movement between restraining walls at least one of which is of energy absorptive material and is positioned in the path of a rebounding actuator element. The collision between the actuator element and the mass results in a transference of kinetic energy to the secondary mass which energy is rapidly dissipated as the secondary mass collides with the energy absorptive material. Also disclosed is a holding coil for holding the actuator element following the collision with the primary mass and an intermittently operable firing coil which when energized overrides the holding force and fires the actuator element.

3,675,173
PRESETTING DEVICE FOR ELECTRONIC MUSICAL INSTRUMENT

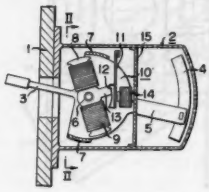
Nobuhiko Suzuki, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki, Hammamatsu-shi, Japan

Continuation of Ser. No. 761,034, Sept. 20, 1968. This application Sept. 22, 1970, Ser. No. 74,475

Claims priority, application Japan, Sept. 26, 1967, 42/61435; Sept. 26, 1967, 42/61436

Int. Cl. H01f 7/08

U.S. Cl. 335—268 **13 Claims**



A device for memorizing and reproducing a position of a continuously adjustable controller, comprising a rotatable yoke of magnetic material and adapted to rotate on a pivot axis to the position corresponding to the position of adjustment of said adjustable controller, an armature rotatably mounted on said pivot axis in close proximity to said rotatable yoke and having a coil thereon and a brake adapted to brake the rotation of said armature, whereby the position of the adjustable controller can be memorized by releasing the brake from the armature and then energizing the armature coil to rotate the armature to the position of said rotatable yoke and the position of the controller can be reproduced by applying the brake to the armature and energizing the armature coil to rotate the rotatable yoke to tee position of the armature.

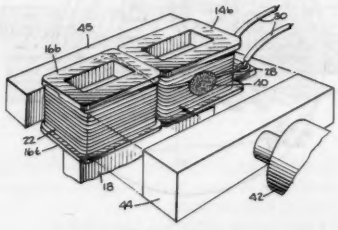
3,675,174
ELECTRICAL COIL AND METHOD OF MANUFACTURING SAME

Stephen Horbach, Mountain Lakes, N.J., assignor to Electronic Associates Inc., West Long Branch, N.J.

Filed Nov. 9, 1970, Ser. No. 87,736

Int. Cl. H01f 5/00

U.S. Cl. 335—299 **17 Claims**



An encapsulated printer coil having two bobbins on each one of which a coil is wound. The coil is wound from a single continuous wire and is wound such that the polarity on one bobbin is opposite from the polarity on the other bobbin. Coil winding to achieve this result occurs by placing the bobbins in axial alignment on a common mandrel and winding the wire in a single rotational direction on both bobbins. The bobbins are subjected to a two-step curing. When initially molded, the bobbins are partially cured to provide wall resilience during winding. They are finally cured during the final encapsulation step. The wire has an epoxy overcoat. Prior to encapsulation the wire is heated by having a current pass through it and pressure is exerted on the wire by having the coil compressed between two jaws. This provides a pre-encapsulation sizing and fixing of the wires. Mold gate positioning and dimensioning provide minimum winding disturbance during encapsulation.

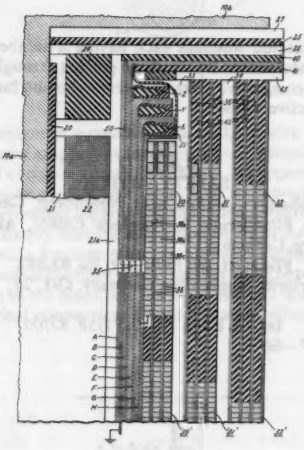
3,675,175
HIGH VOLTAGE COIL ASSEMBLY FOR ELECTRIC INDUCTION APPARATUS

John C. Dutton, Rome, Ga., assignor to General Electric Company

Filed May 10, 1971, Ser. No. 141,735

Int. Cl. H01f 15/04

U.S. Cl. 336—70 **9 Claims**



In a high voltage winding assembly of the balanced multilayer type, axially juxtaposed winding sections each having a line terminal connected to its outermost coil layer are connected in series circuit relation at their innermost coil layers and wound upon a common supporting cylinder of wrapped insulating material. Interwound in the supporting cylinder are a plurality of radially spaced shielding sleeves of electrically conductive material, and at opposite ends of the winding each sleeve is flared radially outward and over opposite ends of the winding to connect with one of a series of axially spaced apart shielding rings. The radially innermost shielding sleeve is connected to ground and the radially outermost shielding sleeve is connected to the winding midpoint between the serially connected, balanced winding sections.

3,675,176
ELECTRICAL TRANSFORMERS

Anthony R. Brown, Wokingham, England, assignor to Racal-Mobilcal Limited, Reading, Berkshire, England

Filed May 12, 1971, Ser. No. 142,567

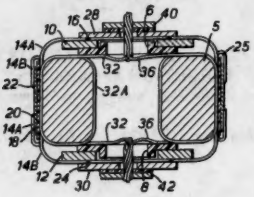
Claims priority, application Great Britain, May 12, 1970, 22,827/70

Int. Cl. H01f 27/28

U.S. Cl. 336—182 **8 Claims**

A wideband transformer, particularly suitable for use in transistor high-frequency amplifiers, is disclosed. The transformer has a toroidal core mounted between first and second electrically conductive, apertured disks. A conductive band encircles the outer periphery of the core. The single-layer primary consists of several parallel-connected windings each having two bi-filar turns one of which is connected to one of

the disks and passes round the core and is connected to the encircling band, and the second of which is connected to the encircling band and passes round the core and terminates on the other disk. The secondary, also single-layer, comprises several parallel-connected windings each having a number of turns, the ends of the secondary windings passing through the apertures of the conductive disks and terminating on further, insulated conductive washers.



3,675,177

SAFETY SWITCH

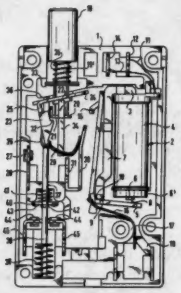
Jakob Ellenberger, Altdorf near Nuernberg, Germany, assignor to Ellenberger & Poenigen GmbH, Altdorf near Nuernberg, Germany

Filed Oct. 26, 1970, Ser. No. 83,892

Claims priority, application Germany, Oct. 27, 1969, P 19 53 984.5

Int. Cl. H01h *71/40, 71/58, 83/06*

U.S. Cl. 337—66 **9 Claims**



A safety switch for connection in a circuit to an electric machine has at least one contact closing member which is held in a position to close the circuit so long as current flows through an electromagnet coil connected to a supply. If the current fails the circuit cannot be reclosed on resumption of the current until a push button on the switch is pressed. A safety device comprising a bimetal strip may be provided to close the switch in the event of current overload.

3,675,178

MANUAL RESET THERMOSTAT

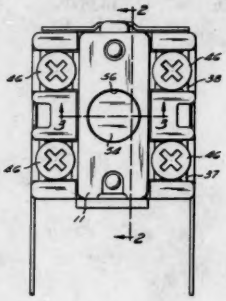
Donald E. Place, Mansfield, Ohio, assignor to Therm-O-Disc, Incorporated, Mansfield, Ohio

Filed Feb. 22, 1971, Ser. No. 117,239

Int. Cl. H01h *37/04, 37/54, 71/58*

U.S. Cl. 337—348 **17 Claims**

A trip-free manual reset bimetal disc operated thermostat is disclosed. A unitary bumper operatively connects the disc to a pair of switches and a manual reset member. The travel of the manual reset member is limited, and the elements are proportioned so that full movement of the reset member does not cause switch operation unless the disc is at reset temperatures. The elements are arranged to cooperate to define a pair of switch chambers which are isolated from each other and are also isolated from a disc cavity.



3,675,179

VARIABLE ZIG-ZAG RESISTOR WITH TABS

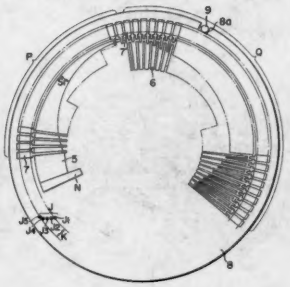
Masaaki Tsukamoto, Kawasaki; Tatsuo Fujii, Tokyo, and Shigeo Ono, Yokohama, all of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Dec. 4, 1970, Ser. No. 95,146

Claims priority, application Japan, Dec. 15, 1969, 44/100115

Int. Cl. H01c *9/04*

U.S. Cl. 338—190 **8 Claims**

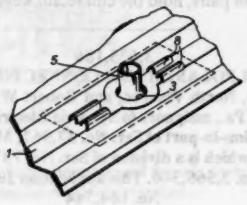


A variable resistor of this invention includes tap electrodes, a sliding brush, zig-zag resistor having resistor films, and if necessary a wedge-shaped resistance layer connected series to the zig-zag resistor. The tap electrodes are spaced apart from each other and located in the path of the sliding brush, and the tap films of the tap electrodes are formed outside of said path. The resistor films of the zig-zag resistor are overlaid on the tap films. And the width of the tap films is made smaller than that of the resistor films but is made equal to the pattern spacing of the resistor films.

3,675,180
FLAT CABLE CONNECTOR

Alan William Ronald Podmore, St. Albans, England, assignor to AMP Incorporated, Harrisburg, Pa.

Filed Sept. 8, 1970, Ser. No. 70,137
Claims priority, application Great Britain, Nov. 6, 1969, 54,405/69
Int. Cl. H01r *15/12*; H05k *1/10*
U.S. Cl. 339—17 F 4 Claims

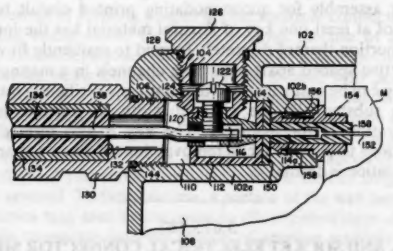


An electrical connector for flat cable, comprising a generally planar sheet metal base having a post receptacle extending generally normally of the base and at least one pair of ears defining a crimping ferrule struck from the base.

3,675,181
COAXIAL CONNECTOR MEANS AFFORDING ALTERNATE 90° SEIZURE

Barre D. Lankford, Seneca Falls, N.Y., and Charles W. Lanham, deceased, late of Silver Spring, Md. (by Betty U. Lanham, administratrix), assignors to Entron, Inc., Silver Spring, Md.

Filed May 14, 1970, Ser. No. 37,275
Int. Cl. H01r *27/00*, *17/04*
U.S. Cl. 339—32 R 3 Claims



Improved coaxial connector means adapted to seize the center conductor of a coaxial cable, said connector being designed to afford alternate insertion and seizure of the cable through either of two orthogonally arranged openings in the connector body. According to a first embodiment, the connector means are integrally formed in a corner portion of an amplifier housing, while in a second embodiment, the connector means are in the form of a separate right-angle connector block adapted for threaded connection with the housing. In a third embodiment, the universal 90° seizure means are in the form of a splice block for splicing together the ends of a pair of coaxial cables.

3,675,182
COMBINATION MULTIPLE WIRE TERMINATION BLOCK AND WIRE STRIPPER

David L. Gregory, Huntsville, Ala., assignor to Avco Corporation, Huntsville, Ala.

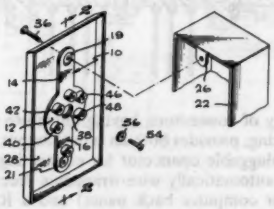
Filed Dec. 28, 1970, Ser. No. 101,938
Int. Cl. H01r *9/08*
U.S. Cl. 339—98 4 Claims

The invention is a combination multiple wire termination block and wire stripper for use in electrical systems requiring a plurality of common connection points. A supporting body or block containing a rotatable metal shaft is secured to a chassis or other convenient support and the insulated wires to be connected are simply inserted in appropriate holes therein and the shaft rotated a fraction of a revolution to partially strip the wires and simultaneously force the bare ends between the internal sides of the block and the shaft, thereby making a common electrical connection. Counterrotation effects a disconnection.

3,675,183
TELEPHONE CORD TERMINAL BLOCK

King B. Drake, Los Angeles, Calif., assignor to Dracon Industries, Chatsworth, Calif.

Filed Aug. 3, 1970, Ser. No. 60,370
Int. Cl. H01r *13/58*, *9/00*
U.S. Cl. 339—103 R 6 Claims

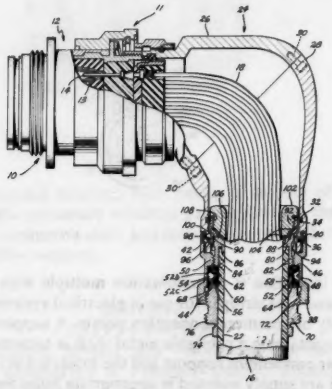


The terminal block joins the interconnecting cable and the telephone cord in a recessed receptacle box in the wall. The terminal block has a binding post for each wire in the telephone cord, and corresponding wires in the interconnecting cable. The terminal block has a central hole, between the terminal posts, for entry of the telephone cord to the terminal posts. The terminal block can be positioned directly beneath the receptacle cover plate, or may be integrally formed therewith.

3,675,184
COMBINED CABLE CLAMP AND SEAL FOR A BACKSHELL

Ottomar H. Vetter, Minneapolis, Minn., assignor to United-Carr, Incorporated, Boston, Mass.

Filed Oct. 17, 1969, Ser. No. 867,183
Int. Cl. H01r *13/58*
U.S. Cl. 339—103 B 10 Claims

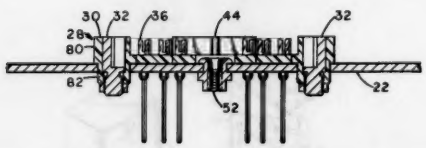


A specially grooved elastomeric ring member provides both the requisite anchoring of the cable at one end of a backshell and an effective sealing in the region where the cable enters the backshell.

3,675,185
ELECTRICAL CONNECTORS FOR DISTRIBUTION PLATE AND RACK AND PANEL APPLICATIONS

Herbert E. Ruehlemann, Huntingdon Valley, and Alexander Wontorsky, Philadelphia, both of Pa., assignors to Elco Corporation, Willow Grove, Pa.

Filed Feb. 3, 1971, Ser. No. 112,164
Int. Cl. H02b *1/02*; H01r *13/64*
U.S. Cl. 339—126 RS 13 Claims

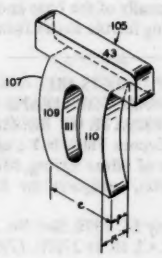


One family of connectors, having miniature size and close contact spacing, provides both an Input/Output (I/O) connector (i.e., a pluggable connector for connecting a plurality of leads to an automatically wire-wrappable electrical distribution plate or computer back panel) and a Rack-and-Panel (R/P) connector (i.e., a pluggable connector for connecting one plurality of leads to another plurality thereof, such as required for connecting an electrical equipment chassis to its mounting rack). The family comprises a R/P receptacle, an I/O receptacle, and a plug which can mate with either receptacle. The plug and both receptacles include flat, fork-like androgynous contacts, those in the plug being recessed in individual cavities and those in the receptacles having free-standing mating (nose) portions. The connectors have orientation keying in the form of side grooves in the plug arranged in an asymmetric pattern; these mate with complimentary integral ribs on (1) the inside of an upstanding upper wall of the R/P receptacle insulator, or (2) the insides of opposed upstanding short side walls of the I/O receptacle insulator. Connector keying is provided by an androgynous pin mounted at each side of the plug, the R/P, and the I/O receptacle ; each pin is asymmetric and is mountable in any of six different positions. The I/O receptacle comprises an assembly of flat modules (center, side, and keying) having cylindrical bottom bushings for holding each module to a foraminous metal plate and holding the module's contacts. The center module contains, in addition to the aforementioned short side walls, bushings for holding a plurality of contacts and an opening to accommodate a socket for a connecting screw. The side modules, provided in pairs, hold sufficient additional contacts to mate with whatever size plug is used. The keying modules, also provided in pairs, hold the connector keying pins.

3,675,186
MEANS FOR POLARIZING A CONNECTOR ASSEMBLY

Max L. Jayne, North Warren, and Robert W. Pihlblad, Warren, both of Pa., assignors to Sylvania Electric Products Inc.

Continuation-in-part of Ser. No. 37,961, May 18, 1968, abandoned, which is a division of Ser. No. 737,163, June 14, 1968, Pat. No. 3,566,340. This application Jan. 7, 1971, Ser. No. 104,744
Int. Cl. H01r *13/64*
U.S. Cl. 339—186 M 7 Claims



Removable key means for polarizing a multiple contact connector assembly for accommodating printed circuit boards whereof at least one key of flexural material has the longitudinal portion thereof discretely formed to resiliently fit within respective spaced apart polarizing channels in a manner that the key can be easily inserted thereinto and resiliently retained within substantially the channel width to provide desired polarization of the assembly. The key is also formed with provisions to provide facile removal thereof when a change of polarization is desired.

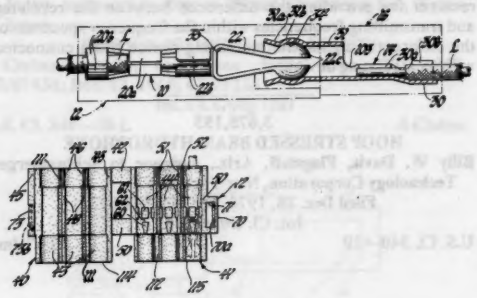
3,675,187
BALL AND SOCKET ELECTRICAL CONNECTOR MEANS

Charles P. Christman, Warren, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 5, 1970, Ser. No. 77,856
Int. Cl. H01r *11/22*
U.S. Cl. 339—211 3 Claims

In a preferred form, this disclosure relates to an electrical connector means comprising a female terminal housed within a female insulator body and a male terminal housed within a male insulator body. The female terminal has a forward portion provided with a tapered entry section and a spherical socket section. The male terminal has the forward portion comprising a pair of spaced arms having hemispherical sections at their forward end which together define a spherical forward end section. The male terminal is connectable to the female terminal by inserting the same therein until its spheri-

cal end section seats within the spherical section of the female terminal. The mating parts provide a large contact area and



mechanically interlock the male and female terminals and the male and female insulator bodies together.

3,675,188

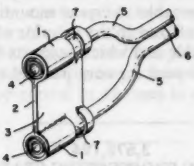
MULTIPLE COLD CRIMP SLEEVE PLUG AND SOCKET

Kenneth John Startin, Hemel Hempstead, and Kamal Ahmed, Middlesex, both of England, assignors to AMP Incorporated, Harrisburg, Pa.

Division of Ser. No. 762,068, Sept. 24, 1968, Pat. No. 3,590,108. This application Sept. 23, 1970, Ser. No. 74,727

Int. Cl. H01r 9/08

U.S. Cl. 339—220 R **2 Claims**



A method of forming plug or socket multiple connectors by the cold crimp sleeve technique involves the use of a twin sleeve extrusion, the sleeves being joined by a web, portions of the sleeves being cut out at intervals around web portions which serve as a carrier strip. Such an extrusion can then be fed conveniently to the dual die of a crimping machine where terminals of a twin core lead are inserted into respective sleeves. On crimping, both sleeves are simultaneously cold formed about respective terminals, and the carrier strip portion is severed. To facilitate use, a portion of the web between the sleeves may also be cut away to allow penetration of one multiple connector into the sleeves of another multiple connector.

3,675,189

ELECTRICAL CONNECTOR

James P. Smith, Warwick, R.I., assignor to Ostby & Barton Co.

Filed Dec. 22, 1970, Ser. No. 100,596

Int. Cl. H01r 9/08

U.S. Cl. 339—221 R **1 Claim**

An electrical connector comprising in combination a panel having an opening extending therethrough, an electrical receptacle, and an elongated male connector. The electrical receptacle has its lower section fixedly held in the top portion of said opening with its bottom edge positioned inwardly from the bottom of said opening. The lower section forms a female connector and conductor securing means are formed on the upper section of the receptacle. The elongated male connector has an external diameter just slightly less than the diameter

of the opening in the panel to provide lateral support and the tip of the connector is provided with means to mate with the female connector.

3,675,190

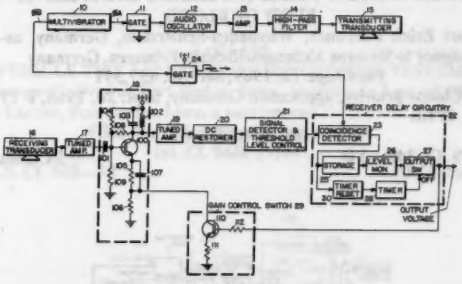
SONIC PRESENCE DETECTOR SYSTEM

John H. Auer, Jr., Fairport, and Jerry P. Huffman, Rochester, both of N.Y., assignors to General Signal Corporation, Rochester, N.Y.

Division of Ser. No. 641,086, April 7, 1967, which is a continuation-in-part of Ser. No. 444,147, March 31, 1965, abandoned. This application May 19, 1969, Ser. No. 836,191

Int. Cl. G01s 9/66

U.S. Cl. 340—1 **11 Claims**

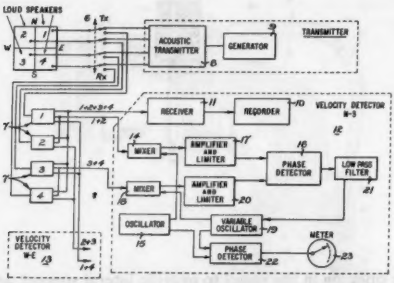


A system for indicating the presence of objects, where sonic energy reflected from the surfaces of objects is recognized and detected. Sonic energy pulses are periodically directed toward objects to be detected and electrical signals are generated in response to that portion of the sonic energy reflected from the object's surface. The signals are conducted to a tuned amplifier gated at intervals corresponding to the anticipated transit times of reflected pulses. Recognition circuitry responds to reflected pulses and produces an indication of object presence when they are coincident with the gate intervals. A timer extinguishes the presence indication when reflected pulses cease to be received for a period of time commensurate with a predetermined minimum rate.

3,675,191
ACOUSTIC SOUNDER

Lindsay G. McAllister, Elizabeth South, South Australia, Australia, assignor to The Commonwealth of Australia Care of The Secretary Department of Supply, Parkes, Canberra, Australia

Filed Dec. 29, 1969, Ser. No. 888,284
Int. Cl. G01s 9/66
U.S. Cl. 340—1 R **8 Claims**

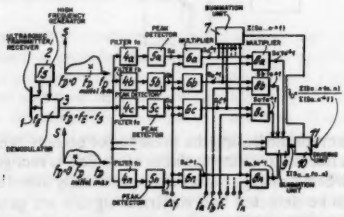


A method of recording upper atmospheric characteristics which comprises transmitting in a generally upward direction recurrent pulses of acoustic energy at a selected frequency band of operation at a repetition interval longer than that required to receive back a reflected signal from a target, receiving the back-scattered energy on a facsimile recorder or other indicating mechanism which records the time and/or intensity and/or duration and/or direction of the backscattered energy to permit upper atmospheric characteristics to be determined at airports or other localities where such information is of vital importance, the apparatus including a transducer to radiate the pulses of acoustic energy and to receive the backscattered energy and to record from it the required data.

3,675,192
ARRANGEMENT FOR ESTABLISHING THE SPEED OF FLOW OF BLOOD

Kurt Erich Fahrbach, Wiesbaden-Schierstein, Germany, assignor to Siemens Aktiengesellschaft, Erlangen, Germany

Filed Sept. 12, 1969, Ser. No. 857,391
Claims priority, application Germany, Sept. 28, 1968, P 17 91 191.0
Int. Cl. G01s 9/66
U.S. Cl. 340—3 D **3 Claims**

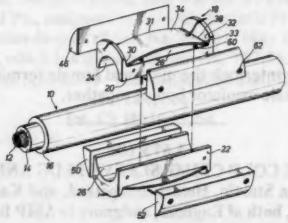


A device for determining the speed of blood flow in blood vessels uses the ultrasonic Doppler effect method and includes an ultrasonic transmitter and a receiver for receiving ultrasounds reflected from the flowing blood as well as means determining a value proportional to the speed of the blood flow from the transmitting and receiving frequencies. The device is particularly characterized by a measuring device which measures the amplitudes of several selected frequencies within the frequency spectrum of the reflected ultrasonic wave or when using a member connected with the ultrasonic receiver for providing the difference between the receiving and transmitting frequencies within the frequency spectrum of the differential signal, the measuring device being connected with a calculating device.

3,675,193
HOOP STRESSED BEAM HYDROPHONE

Billy W. Davis, Flagstaff, Ariz., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Dec. 28, 1970, Ser. No. 101,873
Int. Cl. G01v 1/16
U.S. Cl. 340—10 **21 Claims**

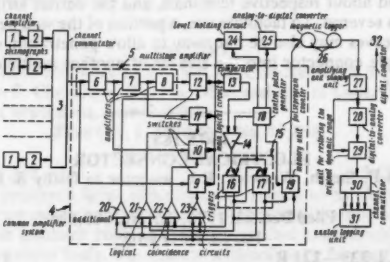


Seismic hydrophone streamer assemblies are constructed utilizing hydrophones which comprise cylindrical segments of crystals disposed with the axis of the crystals transverse to the axis of the streamer cable. This construction permits usage of a crystal having a diameter significantly larger than the diameter of the cable regardless of whether the crystal is disposed internally of a streamer cable. A crystal mounting means is provided which can be affixed to the exterior of a central stress member streamer cable and which supports the crystal solely by the edge of the crystal segment parallel to the cylindrical axis of the cylinder.

3,675,194
SEISMIC PROSPECTING STATION

Gennady Mikhailovich Borkovsky, Khoroshevskoe shasse, 16, kv. 11; Vitaly Borisovich Tsukernik, Chisty pereulok 5a, kv. 27, and Irina Nikolaevna Ierusalimskaya, Khoroshevskoe shasse, 16, kv. 11, all of Moscow, U.S.S.R.

Continuation of Ser. No. 796,328, Feb. 4, 1969, abandoned. This application Feb. 3, 1971, Ser. No. 112,398
Int. Cl. G01v 1/22
U.S. Cl. 340—15.5 DP **1 Claim**



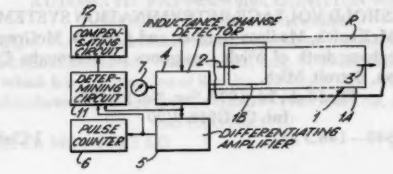
A seismic prospecting station with digital recording of the received seismic signals having a common amplifier system which provides for logging of the information of the seismic prospecting data within a wide dynamic range.

3,675,195

APPARATUS FOR DETECTING TRAFFIC INFORMATION

Shunsuke Iwamoto, and Ryohei Kawasaki, both of Kyoto, Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Nov. 18, 1969, Ser. No. 877,803
Claims priority, application Japan, Nov. 29, 1968, 43/87431; Dec. 12, 1968, 43/91228
Int. Cl. G08g 1/01
U.S. Cl. 340—38 L 6 Claims



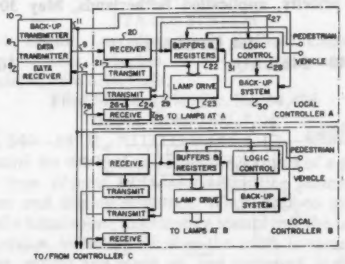
Apparatus for detecting traffic information employs as a vehicle detector a composite inductance loop laid on a road of which traffic information is to be detected. The composite loop consists of a series combination of a large loop portion and a small loop portion. When a vehicle enters the small loop portion, the composite loop suffers a first pulse-like change in the inductance value thereof. As the vehicle moves from the small into the large loop portion the inductance value of the composite loop is reduced to a level lower than the level of the first pulse-like change and kept substantially at that level so long as the vehicle remains inside the large loop portion. When the vehicle is passing the opposite end of the large loop portion, the inductance value thereof again suffers a pulse-like change which is smaller than the first pulse-like change. From such changes in the inductance of the composite loop it will be possible to know traffic informations such as traffic volume, traffic density, vehicle speed, etc. The system may be provided with means for compensating for changes in the inductance of the composite loop caused by changes in environmental conditions.

3,675,196

TRAFFIC SIGNAL CONTROL SYSTEM

Kenneth H. Molloy, Bedford; John P. Ward, Acton, and Victor Mark Benson, Groton, all of Mass., assignors to Computer Systems Engineering, Inc., No. Billerica, Mass.

Filed Jan. 25, 1971, Ser. No. 109,533
Int. Cl. G08g 1/08
U.S. Cl. 340—40 11 Claims



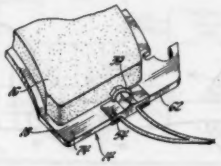
An automobile traffic signal control system controls traffic signals (lights) at a plurality of traffic intersections by way of a master controller which communicates with a local controller at each intersection and transmits pulse trains containing sets of data bits in sequence to the receivers at all the intersections, whereupon the intersection to which a specific set of data bits is addressed stores the set and uses each specific bit in the set to control a specific light or signal at that intersection. In this manner, all lights and signals at all intersections are specifically each controlled by a specific bit in a specific set of bits transmitted by the master controller to the local controllers at the intersections.

3,675,197

BRAKE LINING WEAR SENSING CIRCUIT

Ronald W. Bennett, Miamisburg; Donald L. Parker, Middletown, and Arthur R. Shaw, Dayton, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed June 26, 1970, Ser. No. 50,247
Int. Cl. B60t 17/22
U.S. Cl. 340—52 A 8 Claims



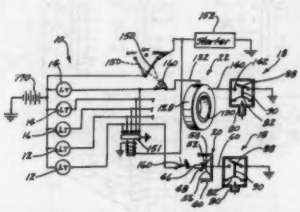
Vehicle brake apparatus including a plurality of series connected conductive sensors secured to the brake shoes of a vehicle by clips which support each of the sensors proximate an electrically grounded brake drum and at a predetermined level above the brake shoes, below which level brake lining wear is deemed excessive. When a brake lining is excessively worn by a brake drum the sensor secured to the brake shoe which supports the brake lining is contacted and grounded by the brake drum. A grounded indicator network is series connected with the sensors to provide for energizing an indicator device when a sensor is grounded so as to indicate excessive wear of a brake lining. A grounded switch is series connected with the sensors and the indicator network for checking the operation of the sensors and the indicator network. When the switch is closed the indicator device is energized if the indicator network and the sensors are operative.

3,675,198

VEHICLE TIRE AIR PRESSURE MONITORING SYSTEM

George C. Drown, Fort Dodge, Iowa, assignor to Leward M. Larson, Fort Dodge, Iowa, a part interest

Filed Aug. 25, 1970, Ser. No. 66,690
Int. Cl. B60c 23/04
U.S. Cl. 340—58 10 Claims



A monitoring electrical circuit includes either a pressure gauge or signal light on the dashboard of an automobile for each of the tires on the vehicle and the circuit includes a pressure responsive switch on each of the wheels. The electrical circuit in each of the front wheels includes a terminal on the outer end of the front axle frictionally engaged by an electrically conductive spring held in and insulated from an enclo-

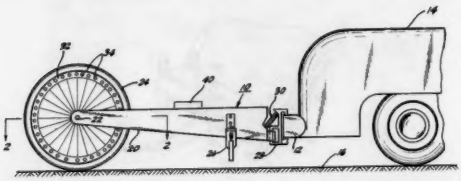
sure cover rotatable with the front wheel. The electrical circuit through the rear wheels involves a conductive ring on the axle at each wheel engaged at its periphery by a carbon brush held stationary on the axle housing. The air pressure signalling units on the wheels are positioned parallel to the axis of rotation of the wheels such that they are unaffected by the centrifugal forces generated by the wheels when turning.

3,675,199

VEHICLE POSITION MARKING DEVICE

Robert W. Jamison, Springfield Township, Delaware County, Pa., and Paul A. Norcross, Downers Grove, Ill., assignors to Union Oil Company of California, Los Angeles, Calif.

Filed June 15, 1970, Ser. No. 46,181
Int. Cl. G01p *3/52*; G01c *22/02*
U.S. Cl. 340—62 **10 Claims**



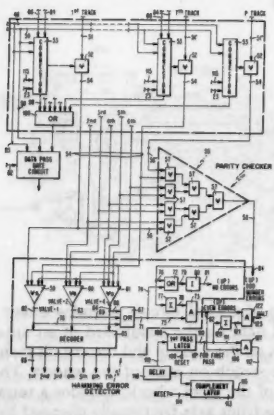
A wheeled device adapted for attachment to a vehicle for marking the location on a surface where the vehicle traveling over the surface attains a selected speed. The device includes a marking gun adapted to fire an electrically detonable cartridge containing a color marking substance and an electronic speedometer that electrically detonates the cartridge at the selected speed, thereby discharging the color marking substance downwardly against the surface to mark thereon the location where the vehicle attains the selected speed.

3,675,200

SYSTEM FOR EXPANDED DETECTION AND CORRECTION OF ERRORS IN PARALLEL BINARY DATA PRODUCED BY DATA TRACKS

Douglas C. Bossen, Wappingers Falls; Robert A. Henle, Hyde Park; Mu Y. Hsiao, Poughkeepsie; Gerald A. Maley, Fishkill, and W. David Pricer, Poughkeepsie, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 23, 1970, Ser. No. 91,726
Int. Cl. G06f *11/08*; G06k *5/00*
U.S. Cl. 340—146.1 F **38 Claims**



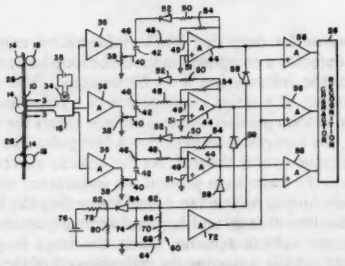
Errors in parallel binary data produced by a plurality of data track, e.g., a plurality of parallel shift registers, are corrected by a system in which the shift registers which are stuck, i.e., inalterable, are determined and counted. By single Hamming error detection means, the presence of a Hamming error and an indication of the bit position of a single Hamming error is made. Comparison means determine if the indicated Hamming error is coincident with a stuck track. Then, dependent on the parity condition of the data as well as the count of stuck tracks, apparatus is provided for complementing one or more of the stuck tracks and/or correcting the indicated Hamming error.

3,675,201

THRESHOLD VOLTAGE DETERMINATION SYSTEM

John A. McKissick, Madison Heights, and Arvin D. McGregor, Birmingham, both of Mich., assignors to Burroughs Corporation, Detroit, Mich.

Filed Feb. 24, 1970, Ser. No. 13,490
Int. Cl. G06k *9/00*
U.S. Cl. 340—146.3 AG **2 Claims**



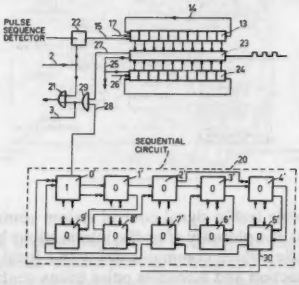
In a character recognition system, a threshold voltage determination system for providing a decision making voltage level separating "black" data signals from "white" data signals. A plurality of scanning amplifiers are individually coupled in an electrical parallel circuit to a voltage divider which responds to variations in the "black" data signals. The threshold voltage determination system generates a voltage level which is intermediate the voltage magnitude of the "black" data signal and the "white" data signal. A minimum threshold voltage level is also provided to maintain a predetermined minimum decision making voltage level in the absence of character being read.

3,675,202

DEVICE FOR CHECKING A GROUP OF SYMBOLS TO WHICH A CHECKING SYMBOL IS JOINED AND FOR DETERMINING THIS CHECKING SYMBOL

Jacobus Verhoeff, Hague, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed June 1, 1970, Ser. No. 41,892
Claims priority, application Netherlands, May 30, 1969, 6908248
Int. Cl. G06f *11/10*
U.S. Cl. 340—146.1 AQ **16 Claims**



A device for checking a group of symbols including a check symbol, the symbols being chosen from 2*m* different symbols,

the device operating by assigning a fixed value to each incoming symbol weighted in accordance with order of reception, forming the product of the incoming product and storing same, the check indicating correctness or incorrectness after reception of an entire group of symbols by comparing the final result with a predetermined value.

3,675,203

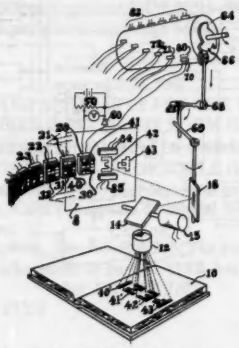
AUTOMATIC PATTERN RECOGNITION WITH WEIGHTED AREA SCANNING

Dwight M. B. Baumann, 39 Amherst Road, Belmont, Mass.

Continuation of Ser. No. 480,242, Aug. 5, 1965, abandoned, which is a continuation of Ser. No. 149,833, Nov. 11, 1961, abandoned. This application April 9, 1969, Ser. No. 852,953

Int. Cl. G06k 9/12

U.S. Cl. 340—146.3 AQ **28 Claims**



The apparatus scans a series of weighted masks to trigger a threshold circuit to produce an output signal when the particular character being compared exceeds a certain level of similarity to the mask. The occurrance of output signals indicates the membership of the pattern in a particular subset, portion, etc. The masks are selected in accordance with the frequency of occurrance of the black portions of the font of characters in the set being considered.

3,675,204

STATUS SYSTEM

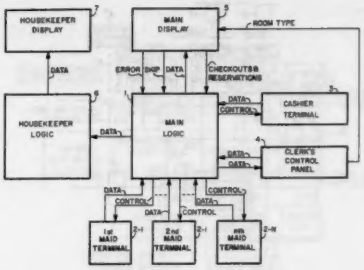
James A. Miehle, Los Altos; David S. Pratt, Cupertino, and Robert M Rees, Atherton, all of Calif., assignors to Varian Associates, Palo Alto, Calif.

Filed May 4, 1970, Ser. No. 34,496

Int. Cl. G08b 5/00, 7/06

U.S. Cl. 340—147 R **31 Claims**

A system for use in monitoring the statuses of a plurality of similar type objects includes transmitting terminals, logic structure and display structure. When used to monitor the status of a hotel room, information identifying the hotel room, and its status, including whether the room is vacant and not made up, vacant and made up, and occupied, is shown on a display. Information identifying a particular room and describing its status is transmitted from any transmitting terminal to the logic. Selected transmitting terminals, such as the cashier's terminal, are given priority in the transmission of data to the main logic over all other transmitting terminals. Structure is provided for indicating errors in the displayed status of a given room resulting from conflicting data relating to that room being received from the transmitting terminals. The system can detect a false report that the room is vacant, or a false report that the room is occupied. Because a hotel contains numerous types of rooms, structure is provided for displaying simultaneously all the rooms of a given type. Both the room clerk and housekeeper have a separate display. The information on the clerk's display is capable of being corrected or updated not only by new information from the transmitting terminals but also by information placed into the system by the



clerk and the cashier. Structure is provided to enable the clerk to change the status of any room to any status that may be desired. The clerk's display also shows running counts of total rooms occupied, total rooms vacant, total number of rooms scheduled to be vacated and total number of rooms reserved for new occupants. To prevent the system from failing to operate when all the data expected from a transmitting terminal fails to be received, structure is provided for automatically restarting the system.

3,675,205

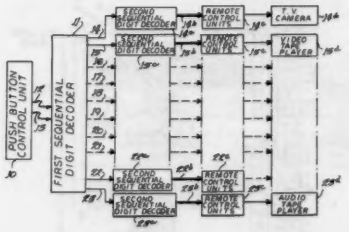
SYSTEM FOR SELECTION AND REMOTE CONTROL WITH SEQUENTIAL DECODING HAVING PLURAL DECODING STAGES

Donald E. Mereen, and Jack E. J. Barrett, both of Appleton, Wis., assignors to Midwest Communications & Audio, Incorporated, Appleton, Wis.

Filed April 8, 1969, Ser. No. 814,423

Int. Cl. H04q 3/00, 11/00

U.S. Cl. 340—147 **12 Claims**

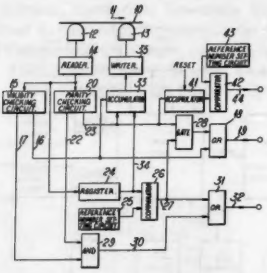


A system is disclosed for selecting and controlling any one of a number of remotely-located, controllable subsystems. A decoding network establishes a direct link from the user to control circuitry for the intended subsystem by sequentially decoding call or address signals initiated by the user and transmitted over a single pair of wires. Once the link from the user to a particular control unit selected has been established, the connection remains secure until broken by the user; and subsequent control signals actuated by the user select and control the desired function of the remote subsystem.

3,675,206
AUTOMATIC TICKET GATE

Keisuke Osaki; Hiroshi Egashira, and Yasunori Hayashi, all of Kyoto, Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Oct. 21, 1970, Ser. No. 82,588
Claims priority, application Japan, Oct. 24, 1969, 44/85427
Int. Cl. H04q 3/02; E05b 65/00
U.S. Cl. 340—149 A 4 Claims

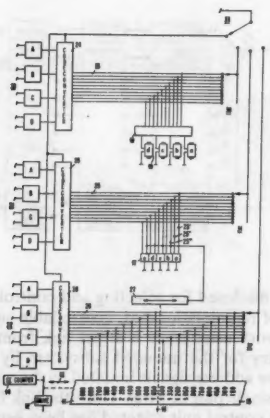


An automatic ticket gate wherein when a ticket is used, its information is read, and depending upon whether the information is valid or not the user of the ticket is allowed or not allowed to pass through the gate. When the ticket has been recognized as invalid due to misreading of the ticket information, the information that the ticket information has been misread is recorded on the ticket and the passenger is allowed to pass through the gate despite the recognition of the ticket as invalid, and only when the information of a ticket has been misread successively more than a predetermined number of times, the user of that ticket is not allowed to pass through the gate.

3,675,207
TEXT SELECTION ARRANGEMENT IN AUTOMATIC PRINT-OUT DEVICES

Klaus Schlickeiser, Boll bei Hechingen, Germany, assignor to Dipl. Ing. Walter Buhmann Elektro-Apparate-Bau GmbH, Hechingen, Hhz., Germany

Filed April 21, 1970, Ser. No. 30,512
Claims priority, application Germany, April 23, 1969, P 19 20 721.7
Int. Cl. G11b 5/56
U.S. Cl. 340—172.5 18 Claims

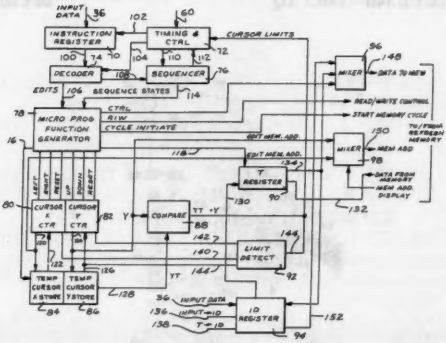


A tape has a plurality of parallel tracks holding selectable texts. A text selection is made by marking three digits on a program card, the first controlling the movement of read heads in a direction transverse to the tracks, the second controlling the longitudinal position of the tape relative to the reading heads, and the third selecting one of the reading heads.

3,675,208
EDITING SYSTEM FOR VIDEO DISPLAY TERMINAL

Irving Gary Bard, Philadelphia, Pa., assignor to Delta Data Systems Corporation, Cornwells Heights, Pa.

Filed May 28, 1970, Ser. No. 41,474
Int. Cl. G06f 3/14
U.S. Cl. 340—172.5 13 Claims



A video display terminal is disclosed having an editing system for controlling the entry of characters on the video display as well as the editing or manipulation of the data provided on the display. The editing system is operable between succeeding scan lines of the video display raster. The editing system includes a microprogram function generator which enables the execution of a plurality of steps in an edit by the mere insertion of a single instruction into the video display terminal.

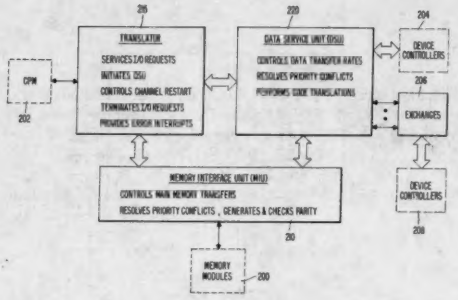
3,675,209
AUTONOMOUS MULTIPLE-PATH INPUT/OUTPUT CONTROL SYSTEM

Joseph C. Trost, Hatboro; Robert V. Bock, Malvern; Frederick H. Gerbstadt, Berwyn; William J. Graham, Drexel Hills; Wilson D. Miles, West Chester, and Charles R. Questa, King of Prussia, all of Pa., assignors to Burroughs Corporation, Detroit, Mich.

Filed Feb. 6, 1970, Ser. No. 9,275
Int. Cl. G06f 3/00
U.S. Cl. 340—172.5 20 Claims

A multiple channel input/output channel system for information processing systems, including one or more control modules each having a unit for translating program elements, modular data service apparatus controlled by I/O data transfer descriptors provided by the translational unit, and a memory interface unit for controlling the transfer of information between the translator and data service units and a data processing system memory. The translator unit asynchronously obtains I/O program words or elements from the processing system and combines designated portions of them to form data transfer descriptors for input/output tasks

to be done. The data service apparatus interfaces with a plurality of peripheral control units which are coupled for control peripheral input/output devices either directly or via multiple-path peripheral exchange units.



3,675,210

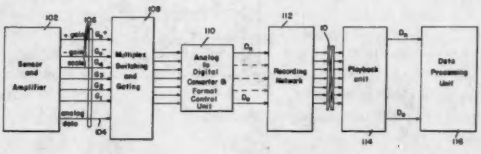
METHOD AND APPARATUS FOR THE TRANSMISSION OF ACQUIRED DATA IN THE FORM OF MAGNITUDE REPRESENTING SIGNALS AND SIGNALS REPRESENTING CHANGES OF SCALE OF MAGNITUDE

Donald Edmund Block, and Nicholas George Alexakis, both of Los Angeles, Calif., assignors to Digital Data Systems, Inc., Houston, Tex.

Filed May 16, 1966, Ser. No. 550,240. The portion of the term of this patent subsequent to June 4, 1988, has been disclaimed.

Int. Cl. G06f *3/05*

U.S. Cl. 340—172.5 **15 Claims**



A data acquisition system is described which enables efficient utilization of a limited data channel by transmitting data signals representing magnitude of a sampled parameter, together with incremental signals representing the scale or gain of the sampling apparatus. Periodically, signals are transmitted which correspond to the scale or gain setting of the sampling equipment, for updating and error correcting purposes. If desirable, the sign of each increment can be a function of the data interval, during which the increment is transmitted.

3,675,211

DATA COMPACTION USING MODIFIED VARIABLE-LENGTH CODING

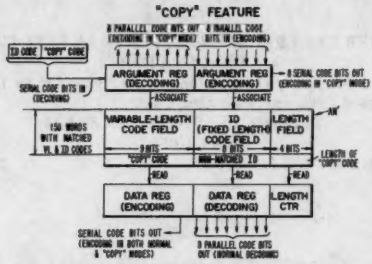
Josef Raviv, Yorktown Heights, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 8, 1970, Ser. No. 70,251

Int. Cl. G06f *5/00*

U.S. Cl. 340—172.5 **9 Claims**

A three-state associative memory is employed as an encoding-decoding instrumentality for making conversions between fixed-length codes and variable-length codes. The available variable-length codes are stored in a field of the associative memory that has uniform word lengths. Memory cells which are not needed for storing bits of the variable-length codes are set to a "don't care" state. Fixed-length codes and code length indications corresponding to these stored variable-length codes are stored in other fields of the associative memory. A "COPY" feature enables the system to function with an associative memory of relatively small size which performs normal encoding and decoding operations for the more frequently occurring codes, thereby achieving a high degree of data compaction, while the less frequently occurring codes are handled in a manner that does not achieve such compaction but requires much less memory. Encoding in the "COPY" mode of operation involves appending the fixed-length code word to a special COPY code which is the same for all code words in this category. Decoding a combination code word of this kind involves discarding the COPY code portion and directly utilizing the remainder as the decoded fixed-length code word. Only one line of stored data is needed in the associative memory to handle all code words which use the COPY code.



3,675,212

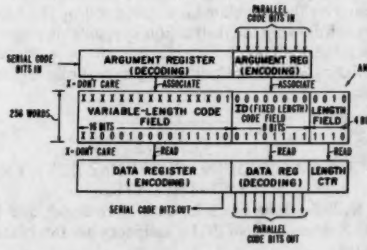
DATA COMPACTION USING VARIABLE-LENGTH CODING

Josef Raviv, Ossining, and Michael A. Wesley, Somers, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 10, 1970, Ser. No. 62,306

Int. Cl. G06f *5/00*; **H03k** *13/00*

U.S. Cl. 340—172.5 **10 Claims**



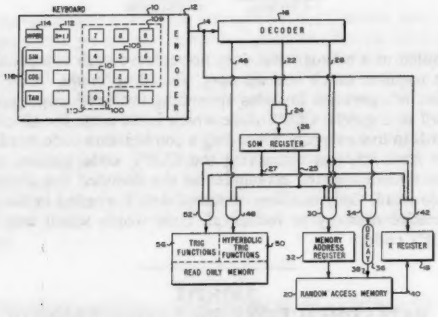
A three-state associative memory is employed as an encoding-decoding instrumentality for making conversions between fixed-length codes and variable-length codes. During the encoding process, associations are performed upon fixed-length codes to find the corresponding variable-length codes. The shorter-length codes are assigned to the most frequently occurring words or bytes for achieving a minimum average code length. The available variable-length codes are stored in a field of the associative memory that has uniform word lengths. Memory cells which are not needed for storing bits of the variable-length codes are set to a "don't care" state. During each

readout of a variable-length code, a corresponding "length" value is read out of the memory to indicate the number of valid bits that are to be read serially from the data register, excluding the "don't cares." During the decoding process, the bits of successive variable-length codes are fed serially to an argument register, and as each association is performed upon a variable-length code to find the corresponding fixed-length code, the "length" field indicates the number of bit positions by which the contents of the argument register are to be shifted for bringing the next variable-length code bit string into registry.

3,675,213
STORED DATA RECALL MEANS FOR AN ELECTRONIC CALCULATOR

Richard M. Spangler, Loveland, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Oct. 14, 1970, Ser. No. 80,534
Int. Cl. G06f *3/02*
U.S. Cl. 340—172.5 **2 Claims**



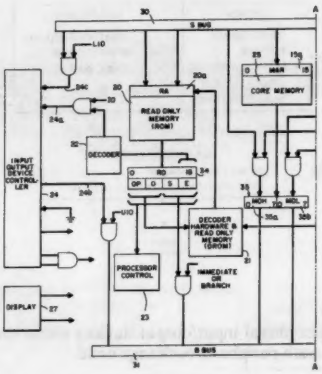
A calculator instruction key is provided which preconditions the calculator to transfer information to a display register from an address in memory to be specified by subsequent key strokes. The above-mentioned calculator instruction key generates a key code identical to a second calculator instruction key which also preconditions the calculator to compute a hyperbolic trigonometric function. The function performed by the calculator is determined by the kind of key depressed following the instruction key, an alpha-numeric key initiating the memory transfer operation or a trigonometric key initiating the computation of a hyperbolic trigonometric function.

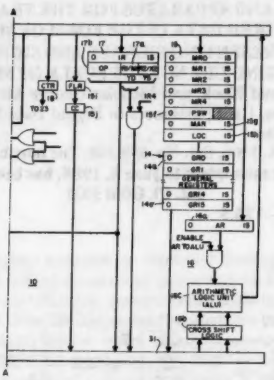
3,675,214
PROCESSOR SERVICING EXTERNAL DEVICES, REAL AND SIMULATED

David R. Ellis; John Michels, both of Holmdel, and Ira Gabbert, Neptune, all of N.J., assignors to Interdata, Incorporated

Filed July 17, 1970, Ser. No. 55,894
Int. Cl. G06f *9/16, 9/18*
U.S. Cl. 340—172.5 **6 Claims**

This invention pertains to the performance of a microroutine in accordance with a program being run on a processor having user's instructions in main memory. External devices having discrete device numbers cause interrupt signals to be transmitted to the microroutine which acknowledges the interrupt signal and obtains the device number associated with the signal. A service pointer is fetched from the service pointer table in the main memory corresponding to the device number, which in turn defines a service block function to be fetched from the main memory. Input - output service is then performed for the external devices in accordance with the interrupt service block function without interrupting the program that is being currently run.





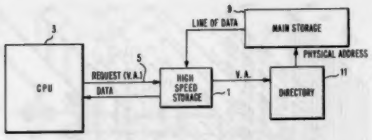
3,675,215
PSEUDO-RANDOM CODE IMPLEMENTED VARIABLE BLOCK-SIZE STORAGE MAPPING DEVICE AND METHOD

Richard F. Arnold, Palo Alto, Calif.; Philip S. Dauber, Ossining, N.Y., and Edward H. Sussenguth, Stamford, Conn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 29, 1970, Ser. No. 50,485
Int. Cl. G06f *9/20*
U.S. Cl. 340—172.5 **12 Claims**

A directory, or index, of variable-sized pages of data for use in a two-level storage system employing virtual addressing, wherein data is stored in a large capacity main storage and retrieved to a smaller, faster buffer storage for processing. If a desired piece of data indicated by a virtual address is not currently resident in buffer storage, the location of the beginning of the page containing that data in main storage is found by searching the directory. Directory addresses for searching the directory are formed by a pseudo-random function of two parameters, the virtual address and a count. Since a larger

page-size entry will be addressed statistically more frequently than a smaller page-size entry, a new directory entry for a given page size is made in the first location along its algorithm

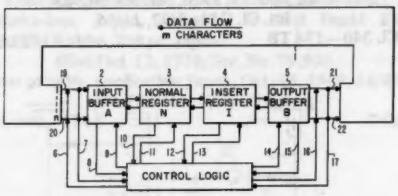


chain which currently contains either an invalid entry or a smaller page-size entry. Thus, it may be necessary to relocate a smaller page-size entry further down its chain.

3,675,216
NO CLOCK SHIFT REGISTER AND CONTROL TECHNIQUE

Randell L. James, Austin, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 8, 1971, Ser. No. 104,888
Int. Cl. G06f 3/00, 3/10
U.S. Cl. 340—172.5 **10 Claims**



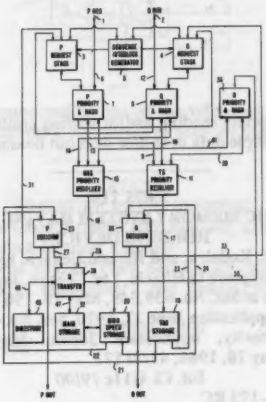
A shift register and control technique in which no clocking is employed between the control logic, the shift register, and the input to and output from the shift register. Upon start-up of the system a flag code is loaded at random, into a stage of the register and the remaining stages or data positions of the register are loaded with dummy code. Thereafter, the control logic and input to and output from the shift register is timewise controlled by the sensing of the flag which, in the case that the associated input and output means is a typewriter, moves synchronously with the print element or carriage of the typewriter. Four buffers which are connected to the control logic and the data buss for data input to an output from the shift register are connected between the input and output stages of the register and these buffers are logically selectively introduced into the data flow upon the sensing of the flag in the output stage of the register to accomplish timewise shifting of the data in the register for insertion of additional data, deletion of data, and other usual functions such as error correct backspace. Due to the utilization of the sensing of the flag to control the instant that a change in the data path is made no clocking between the input/output and control logic is required and additionally, the length of the shift register can be increased or decreased or the basic timing changed without any change in the control logic.

3,675,217
SEQUENCE INTERLOCKING AND PRIORITY APPARATUS

Philip S. Dauber, Ossining, N.Y.; Russell J. Robelen, Palo Alto, and John R. Wierzbiski, Saratoga, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 23, 1969, Ser. No. 887,468
Int. Cl. G06f 13/00, 9/18
U.S. Cl. 340—172.5 **11 Claims**

Described is a sequence interlock generator and priority apparatus combination suitable for use in a storage control system for a two-level storage, wherein the storage system includes a high-speed storage against which requests for data are processed and a slower, larger-capacity main storage. Requests can be received and serviced concurrently at a plurality of request ports in the system where they are buffered in request stacks. A tag storage serves as an index to the data currently resident in high-speed storage and a directory storage acts as an index to data currently in main storage. The sequence interlock generator interlocks requests in the plurality of request stacks to insure that requests to the same storage area are performed in proper sequence to insure data integrity. A sequence interlock vector is computed when the request first enters its request port and is appended to the



request until the request is clear to request service. A request is received in terms of a logical address. The logical address is transformed into a plurality of physical addresses in high-speed storage. The physical addresses are used to address corresponding tags from the tag storage to determine the contents of the desired addresses in high-speed storage. The priority apparatus essentially splits the request into two priority determinations, one for priority to access the tag storage and the second for priority to access the data storage. The ideal situation is for tags and storage to be accessed concurrently. However, the invention makes provision for action to begin upon the tags if the tag storage can be accessed due to conflicts for accessing the addressable entity in high-speed storage. As a consequence of the invention, initiation of service of a given request is begun at the earliest possible time.

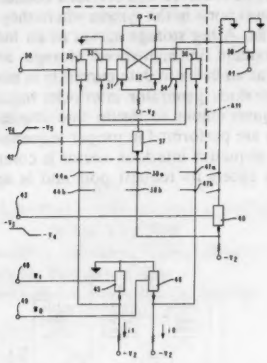
3,675,218
INDEPENDENT READ-WRITE MONOLITHIC MEMORY ARRAY

Robert F. Sechler, Wappingers Falls, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 15, 1970, Ser. No. 3,163
Int. Cl. G11c 11/40
U.S. Cl. 340—173 FF **9 Claims**

A memory array is formed of a plurality of memory cells arranged in a matrix and providing for the simultaneous writing of information into one portion of the array while accomplishing the retrieval of information from another portion of the array. Each cell of the array utilizes cross-coupled flip flops as the storage circuit and includes control circuitry for reading

from the cell and independent control circuitry for writing into the cell. Each cell of the array is further expandable by



adding appropriate reading and/or writing control circuits for providing multiple data in and/or data out bussing.

3,675,219

DYNAMIC MEMORY SYSTEM HAVING SIGNAL HOLDING DEVICE

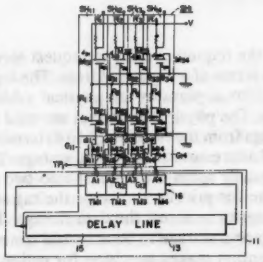
Jun Kawasaki, Kodaira, and Hiroshi Uehara, Kokubunji, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 639,549, May 18, 1967, abandoned. This application June 22, 1970, Ser. No. 48,446

Claims priority, application Japan, May 18, 1966, 41/31170; May 18, 1966, 41/31171

Int. Cl. G11c *19/00*

U.S. Cl. 340—173 RC **20 Claims**



A dynamic memory system wherein a continuously recirculating delay loop includes a plurality of read-out stations and a plurality of gating circuits are provided to selectively connect a plurality of corresponding signal holding circuits to said read-out stations at periodic times of the recirculating cycle, each holding circuit comprising an amplifying insulated gate field effect transistor and storage capacitance means formed by the interelectrode capacitance of said field effect transistor.

3,675,220

PLANAR RANDOM ACCESS FERROELECTRIC COMPUTER MEMORY

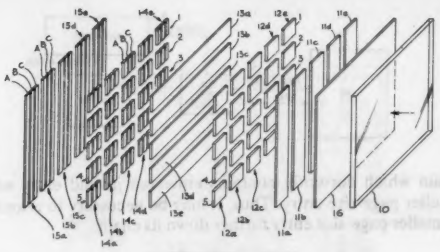
Alvin A. Snaper; George D. Gregory, and Miles R. Munroe, all of Las Vegas, Nev., assignors to Advanced Patent Technology, Inc., Las Vegas, Nev.

Filed Nov. 30, 1970, Ser. No. 93,551

Int. Cl. G11c *11/22*

U.S. Cl. 340—173.2 **1 Claim**

This memory device uses ferroelectric materials and it stores information as a change in the crystalline formation of the ferroelectric material. In turn, this change manifests itself



as a change in the light intensity of polarized light incident upon the ferroelectric bits.

3,675,221

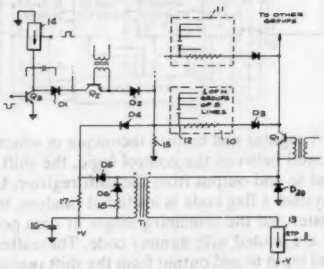
MAGNETIC CORE MEMORY LINE SINK VOLTAGE STABILIZATION SYSTEM

Philip A. Harding, Palos Verdes, Calif., assignor to Electronic Memories and Magnetics Corporation, Los Angeles, Calif.

Filed June 29, 1970, Ser. No. 50,563

Int. Cl. G11c *5/02, 11/06*

U.S. Cl. 340—174 TB **12 Claims**



A magnetic core memory line sink voltage stabilization system is disclosed using a current or voltage source to charge a group of selected lines. The sink ends through which the lines are charged are terminated with the approximate characteristic impedance of all lines connnected at their sink end to a common junction, and a balanced transformer is employed to keep the potential of the junction substantially constant when a current pulse is applied at the drive end of a selected pulse. The primary of the transformer is connected in series with a current pulse source, and the secondary is connected in parallel with the terminating resistor. The turns ratio of the transformer and polarity of the secondary winding are so selected as to inject a current into the common junction substantially equal to that driven through the line by the current pulse source, and of proper polarity, to maintain the potential of the common junction substantially constant.

3,675,222

FRAME STRUCTURE FOR MAGNETIC MEMORY PLANES

Seihin Kobayashi; Michihiro Torii, and Fujio Yamakawa, all of Shizuoka-ken, Japan, assignors to Fuji Denki Kagaku Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 8, 1970, Ser. No. 79,081

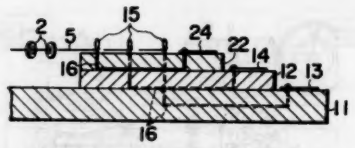
Claims priority, application Japan, Oct. 14, 1969, 44/81988

Int. Cl. G11c *5/04, 11/06*

U.S. Cl. 340—174 MA **7 Claims**

An improved frame structure for a magnetic memory plane is provided, which comprises a plurality of stepped planes

descending from the inner circumference of said frame toward the outer circumference thereof, a number of terminal plates being provided on the stepped planes so that the adjacent terminal plates may be disposed on the different stepped planes



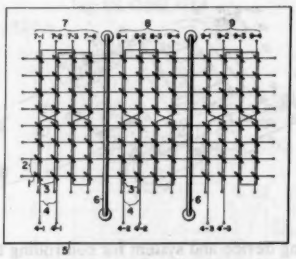
with a fixed space. A number of metal bars are each connected at their outer ends to the outermost terminal plates on the lowest stepped plane and, at their inner vertical portions, are projected above the uppermost stepped plane to a drive winding.

3,675,223

MAGNETIC MEMORY PLANE

Seihin Kobayashi; Michihiro Torii, and Koichiro Suzuki, all of Shizuoka-ken, Japan, assignors to Fuji Denki Kagaki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 12, 1970, Ser. No. 79,926
Claims priority, application Japan, Oct. 15, 1969, 44/81853
Int. Cl. G11c 7/02, 11/06
U.S. Cl. 340—174 S 7 Claims



A magnetic memory plane is divided into a plurality of sections each comprising a plurality of memory elements and a separate sense means. The improvement comprises a conductor provided between the adjacent sections and connected to a ground plane to form a closed electric circuit therewith.

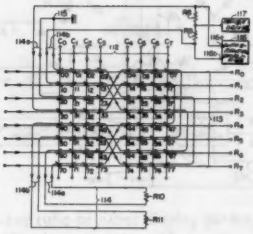
3,675,224

COINCIDENT-CURRENT MAGNETIC CORE MEMORY WITH COMBINED INHIBIT AND SENSE WINDING

Shoichi Ninomiya; Masaaki Sakai; Sakae Oka, all of Kawasaki-shi, and Kikunobu Kusunoki, Tokyo, all of Japan, assignors to Fujitsu Limited, Kawasaki-shi and Nippon Telegraph and Telephone Public Corporation, Tokyo, Japan, a part interest to each

Continuation-in-part of Ser. No. 505,556, Oct. 28, 1965, abandoned. This application Aug. 21, 1969, Ser. No. 852,066
Claims priority, application Japan, Oct. 31, 1964, 39/61740
Int. Cl. G11c 5/02, 5/06, 11/06
U.S. Cl. 340—174 6 Claims

In a coincident-current magnetic core memory having the form of a matrix of toroidal magnet cores threaded by a pair of row and column half-select wires, a common inhibit and sense winding composed of two bifilar winding sections is wound back and forth in one direction with each of the sections being staggered upon passing from one to another of two groups of the cores and with one bifilar winding section being interlaced with the other winding section. A differential amplifier has its



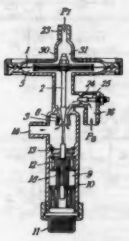
inputs each connected to one of the bifilar winding sections and an inhibit driver is connected to both the amplifier inputs.

3,675,225

PRESSURE RATIO SENSING

Stanley George Glaze, Brierley Hill, England, assignor to H. M. Hobson Limited, London, England

Filed Nov. 12, 1969, Ser. No. 875,949
Claims priority, application Great Britain, Nov. 12, 1968, 53,600/68
Int. Cl. G08c 19/00
U.S. Cl. 340—196 3 Claims



A pressure ratio sensor for producing a signal proportional to the ratio of two pneumatic pressures derived from two probes and comprising a casing, a diaphragm dividing the casing into two chambers each having an inlet, a needle attached to the diaphragm and extending through one of the chambers and controlling, in accordance with the position of the diaphragm, the effective area of an outlet from that chamber, the signal pressure from one probe being applied directly to one of the inlets, the signal pressure of the other probe being multiplied by a known factor, the multiplied signal pressure being applied to the other inlet and the position of the needle producing a signal indicative of the ratio.

3,675,226

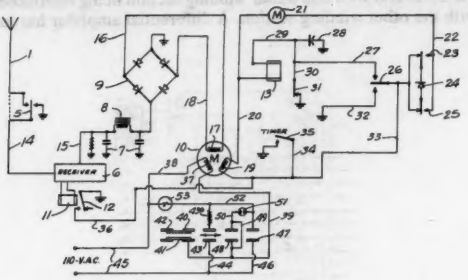
RADIO REMOTE CONTROL FOR A SLIDE PROJECTOR

J. Burton Long, deceased, late of Sarasota, Fla. (by Clarice Cleland Long, executrix) 2924 Grove St., Sarasota, Fla.

Filed May 4, 1970, Ser. No. 34,461
Int. Cl. H04b 7/00
U.S. Cl. 343—225 2 Claims

The present remote control system is for rotating a drum type magazine of a slide projector. A portable radio trans-

mitter is employed for sending a signal, when operated, to said system for presenting a different slide in the magazine to be projected by the slide projector.



3,675,227

LIQUID-LEVEL DROP ALARMING SYSTEM

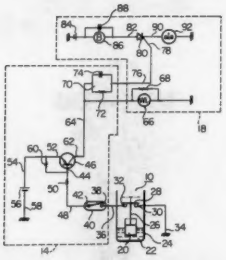
Noburu Fukasawa, and Yukiyoshi Hatori, both of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed March 22, 1971, Ser. No. 126,499

Claims priority, application Japan, April 1, 1970, 45/27115

Int. Cl. B60r *18/00*; G08b *23/00*

U.S. Cl. 340—244 A **6 Claims**



A liquid-level drop alarming system is provided, which comprises a sensor for sensing the level of a liquid stored in a reservoir, a drive signal generator for generating a drive signal in accordance with the output from the sensor and an alarm means for producing an alarm signal in accordance with the drive signal. The drive signal generator is adapted to be inoperative or disabled when the liquid is localized with the reservoir inclined from the horizontal plane or subjected to vibrations, acceleration or deceleration.

3,675,228

DEVICE FOR ELECTROPHOTOCOPYING MACHINES FOR DETECTING WHETHER A USABLE LENGTH OF COPY PAPER IS LEFT ON A ROLL THEREOF

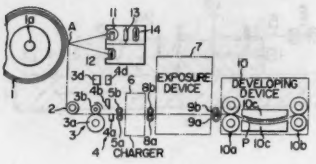
Minoru Iwamoto, Tokyo, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Filed Dec. 16, 1970, Ser. No. 98,586

Int. Cl. G08b *21/00*

U.S. Cl. 340—259 **5 Claims**

A detection device wherein the copy paper unrolled from a roll of copy paper loaded in the electrophotocopying machine is illuminated at a predetermined location so that light reflected by or transmitted through the copy paper may be incident upon a photoelectric element whose output varies depending upon whether the copy paper is present or not at the predetermined location. Switching means is provided which is actuated by the output of the photoelectric element in such a manner that when the last portion of the copy paper of the roll is sufficient in length to make one copy but not sufficient to make two copies it will be transported through the machine and discharged therefrom without being cut into a predetermined size by the cutting means which is deactivated by the switching means and then the machine may be automatically stopped. Clogging of copy paper in the machine may be prevented and photocopying operation may be greatly facilitated.



3,675,229

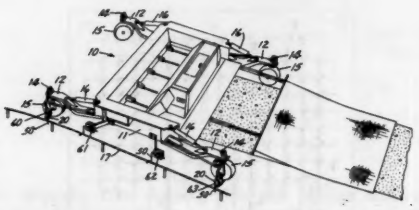
SENSING CONTROL FOR A ROAD BUILDING MACHINE

Richard H. Rink, Huron, S. Dak., assignor to Huron Manufacturing Corporation, Huron, S. Dak.

Filed Aug. 26, 1970, Ser. No. 66,990

Int. Cl. G08b *21/00*

U.S. Cl. 340—267 R **5 Claims**



A sensing device and system for controlling the horizontal and/or vertical position of a steerable, vertically adjustable road building machine. The device including a movable dial with exposed contacts about its periphery which make connection with fixed contacts upon movement thereof in response to relative movement of the machine horizontally or vertically to a preset line to operate electrically a power means to restore the machine to a desired position. The system affords the operation of a signal if any abnormal movement is sensed as may happen if the preset line ends or breaks and the electrical switching is bypassed which would normally perform a control function to adjust for the relative movement.

3,675,230

APPARATUS FOR DECODING GRAPHIC-DISPLAY INFORMATION

Michael Lloyd Victor Pitteway, Knole Hill, England, assignor to National Research Development Corporation, London, England

Filed July 28, 1969, Ser. No. 845,394

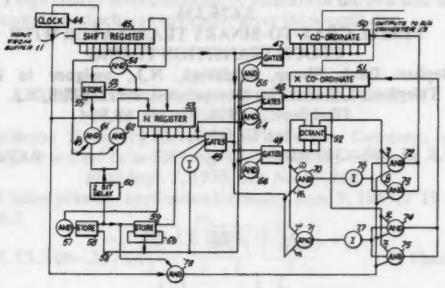
Claims priority, application Great Britain, July 29, 1968, 36,172/68

Int. Cl. G06f *3/14*

U.S. Cl. 340—324 A **7 Claims**

Apparatus is described for decoding information specifying a display for display means, such as a cathode-ray tube or an

incremental plotter. The information is received in a form which specifies a number of curves making up the display in a small number of "bits". Each curve is specified by the origin of the curve, one of a number of sectors of the display area in which the curve falls each sector bounded by straight lines



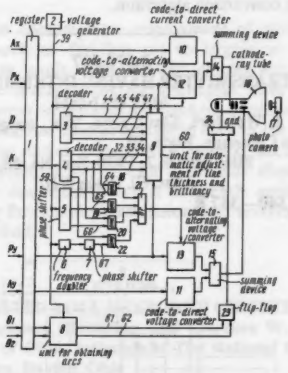
radiating from the origin point of the curve, the direction of a series of elemental lines each connected the proceeding and making up the curve, and the number of such lines in the curve. The apparatus decodes this information, using logic circuits, to provide a signal suitable for the display means.

3,675,231

AUTOMATIC DEVICE FOR MAKING DRAWINGS

Marlen Solomonovich Bezrodny, Pavlova Pole, 5 Mikroraion, 76, kv. 43, Kharkov, U.S.S.R.

Filed Nov. 7, 1968, Ser. No. 774,132
Int. Cl. G06f *3/14*
U.S. Cl. 340—324 A **8 Claims**



An automatic drawing device wherein use is made of codes set by digital computer, the codes describing the position of a line on the drawing, length of projection and the configuration of the lines.

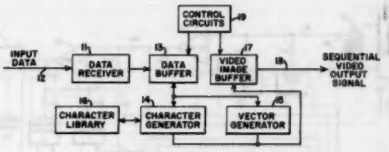
3,675,232

VIDEO GENERATOR FOR DATA DISPLAY

Frederick D. Strout, Phoenix, Ariz., assignor to General Electric Company

Filed May 21, 1969, Ser. No. 826,332
Int. Cl. G06f *3/14*
U.S. Cl. 340—324 A **9 Claims**

Video generator circuitry is disclosed for converting randomly occurring input data information into a time-sequential digital video display output signal. The circuits include a video image buffer of relatively small storage capacity which converts random video signals into a sequential video output signal suitable for displaying the data (such as numerals, letters, vectors, pictures, or special characters) on a scanned-



raster cathode-ray tube or other display device. The aforesaid random video signals are produced by means including video pattern generators and a data buffer having a thread address means for sorting the randomly provided input data into proper groupings for writing information into the video image buffer.

3,675,233

LIGHT REFERENCE SYSTEM FOR RAILROAD TRACK SURVEYING

Odon Steven Bencsics, 4917 Coronation Ave., Montreal, Quebec, Canada, and Helmut Rolf Erich Von Beckmann, 189 Castle Road, Columbia, S.C.

Filed Sept. 5, 1969, Ser. No. 855,591
Int. Cl. G08b *13/00*
U.S. Cl. 340—258 B **5 Claims**

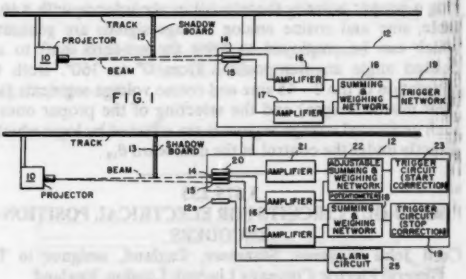


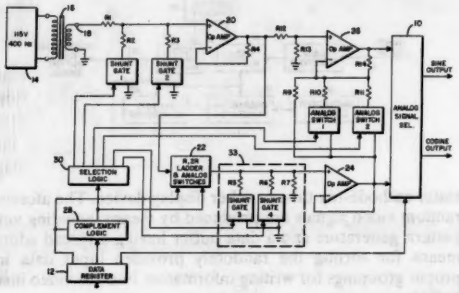
FIG. 1

This invention relates to reference systems of the type used for surveying railroad track in which a light beam transmitter, a beam receiver spaced therefrom and a railroad condition sensor having a single edged shadow board is located therebetween. The invention contemplates positioning at least two photo-cells in the receiver physically closely spaced apart in the direction of shadow board motion. The outputs from the photo-electric cells are electrically connected in a differential configuration so that a command signal is generated to stop shadow board movement into the transmitted beam when the shadow board reaches a datum position at which point the distribution of the transmitted light on the photo-cells will have achieved a predetermined difference. In one aspect of the invention a deadband producing photo-cell is provided in the receiver and located physically closely spaced apart from the other two photo-cells in the direction of the shadow board motion and inwardly of the edge thereof when it is in datum position. The deadband producing photo-cell is electrically connected to generate a command signal to commence shadow board movement into the beam when the deadband producing photo-electric cell is exposed by a predetermined amount to the transmitted beam.

3,675,234
DIGITAL-TO-SYNCHRO/RESOLVER CONVERTER

Louis C. Metz, St. Paul, Minn., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Feb. 11, 1971, Ser. No. 114,444
Int. Cl. H03k 13/04
U.S. Cl. 340—347 DA 9 Claims

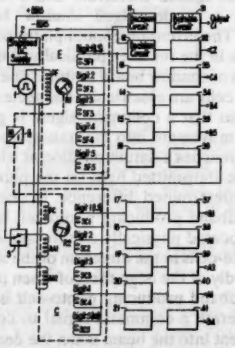


A digital-data to shaft-angle converter that compensates for the non-linear relationship between a 12-bit data word θ_{12}, representing the desired shaft angle, and its corresponding trigonometric sine and cosine functions as represented by analog voltages. Basically the invention constructs, by empirical means and using linear voltage signals, first and second voltage segments whose amplitudes closely approximate sine and cosine functions, respectively, over the 0° – 45° range. The invention is also capable of constructing by empirical means, third and fourth signals which are mirror images of the first and second signals described above. By proper selection of two of the four possible signals described above and assigning a proper polarity thereto, all in accordance with a truth table, sine and cosine analog voltage signals are generated which can be employed to drive the synchro shaft to any desired angle angular position from 0° to 360°. Both the generation of the 0 – 45 sine and cosine voltage segments (and their mirror images) and the selecting of the proper ones of such generated voltage segments are effected by logic which is directly under the control of the data word θ_{12}.

3,675,235
READ-OUT CIRCUITS FOR ELECTRICAL POSITION-ENCODERS

Cecil John Wayman, Stanmore, England, assignor to The General Electric Company Limited, London, England

Filed Aug. 11, 1970, Ser. No. 62,847
Int. Cl. G08c 9/00
U.S. Cl. 340—347 P 7 Claims

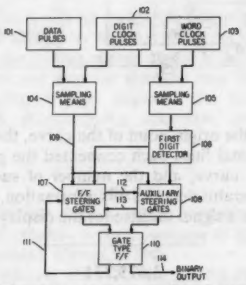


A read-out circuit for a digital position encoder which reads directly in, say, a reflected binary code, and which is required to read in, say, a decimalized binary code. The direct read-out signals are biased in various ways e.g. by adding a fraction of one to another, and by simple d.c. biasing, so as to produce final output signals which have a basic digital cycle of other than the four-unit cycle of a reflected binary code, e.g. a 10-unit cycle.

3,675,236
SERIAL GRAY-TO-BINARY TRANSLATOR WITH CLOCK TRANSITION TIMING

Stephen Davis Shoap, Matawan, N.J., assignor to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.

Filed Sept. 2, 1970, Ser. No. 68,904
Int. Cl. H03k 13/24
U.S. Cl. 340—347 DD 6 Claims

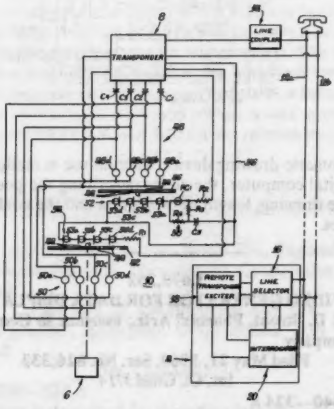


A Gray-to-Binary code converter relies on clock transition sampling, rather than requiring coincidence of pulse width and pulse phase. Half-period timing signals are complemented and used for precise time delays. Discrete conversion control apparatus under control of the timing signals presets conversion apparatus for translation in accordance with a multi-equation conversion algorithm.

3,675,237
CODE TRANSMITTER HAVING INTERMITTENT DRIVE MECHANISM

William J. Weinfurt, Elm Grove, Wis., assignor to McGraw-Edison Company, Elgin, Ill.

Filed March 2, 1970, Ser. No. 15,362
Int. Cl. H04g 9/10
U.S. Cl. 340—357 R 15 Claims



An intermittent drive mechanism for an encoding device is driven by a continuously rotating drive source. First and

second Geneva drive discs are each rotated through a sequence of rotated rapid incremental displacements to a plurality of positions each of which are utilized for providing coded information. The first Geneva drive disc is rotated by a drive means which is moved to a high energy level condition by the drive source and permitted to rapidly discharge. A second drive means is connected to the first disc and is moved to a high energy level condition by rotation of the first disc and permitted to discharge to rapidly drive the second disc.

3,675,238
INTERPOLATION MEANS FOR DISPLACEMENT MEASUREMENT

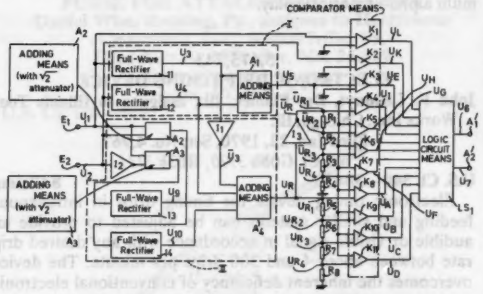
Karlheinz Butscher, Langenargen/Bodensee, Germany, assignor to Carl Zeiss-Stiftung, Wuerttemberg, Germany

Filed Sept. 3, 1970, Ser. No. 69,264

Claims priority, application Germany, June 9, 1969, P 19 45 206.3

Int. Cl. H03k *13/14*

U.S. Cl. 340—347 SY **11 Claims**



The invention contemplates employment of plural preset comparators, such as flip-flop set to trigger at different reference-voltage levels, to accurately identify and quantize discrete voltage levels in the electric-signal wave form by which displacement increments are tracked, or picked off, for measurement. The fast change of state in each of the elements of such a device makes possible the prompt, accurate and unambiguous identification of each particular displacement increment. The described device is inherently applicable to digital encoding for remote transmission, and several embodiments are described.

3,675,239
UNLIMITED ROLL KEYBOARD CIRCUIT

Howard T. Ackerman, Kettering, and Clarence W. Kessler, Dayton, both of Ohio, assignors to The National Cash Register Company, Dayton, Ohio

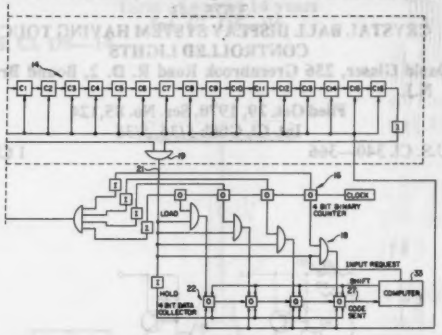
Filed Sept. 14, 1970, Ser. No. 71,972

Int. Cl. G08c *15/12*

U.S. Cl. 340—365 **7 Claims**

The present invention relates to a full-roll keyboard circuit which provides unlimited roll of the keys within the full-roll keyboard circuit. The keys are connected individually to corresponding cells of a first shift register. Data is entered parallelly during a first strobe pulse from the depressed keys into the first shift register. Thereafter during a first 16 bit cycle, bits are shifted serially out of the first shift register into a compare circuit and also into a second shift register. A 4 bit polynomial counter counts the codes of the 16 keys during the 16 bit cycle. The bits in the first shift register are shifted into the compare circuit throughout the first 16 bit cycle to cause loading of the corresponding binary information from the polynomial counter into a key code collector.

New bits are then read from the keyboard into the first shift register during a second strobe pulse. During a second 16 bit cycle, after the second strobe pulse, the bits in the first shift register are shifted into the second shift register and to the compare circuit. Bits from the first shift register and bits from the second shift register are individually compared during the second 16 bit cycle by the compare circuit. If a one bit simul-



taneously comes from the first shift register and a one bit comes from the second shift register during the second 16 bit cycle, this indicates that a certain key within the keyboard was depressed both during the first strobe pulse and also during the second strobe pulse. The binary information from the polynomial counter for that key will not be loaded again into the key code collector at this time.

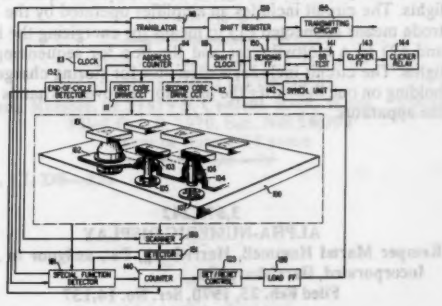
3,675,240
KEYBOARD ENCODING ARRANGEMENT

Robert V. Anderson, Westfield, and David W. Hagelbarger, Morris Township, Morris County, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 23, 1969, Ser. No. 887,655

Int. Cl. G08c *1/00*

U.S. Cl. 340—365 **5 Claims**



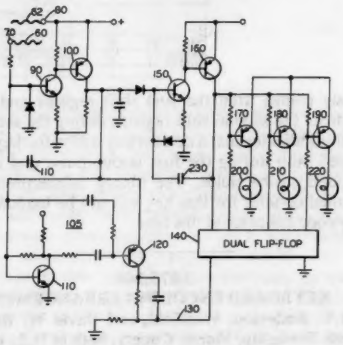
A magnetic keyboard and associated encoding circuitry are described. A permanent magnet on each of the keys of the keyboard alters the switching characteristics of a ferrite core associated with that key when the key is depressed. Logic circuitry is provided which determines when the addresses of depressed keys are to be entered in an output shift register and which addresses are to be transmitted. A unique lockout fea-

ture prevents both the transmission of address information from the output shift register if more than one key is depressed and the inadvertent retransmission of the address of a core already transmitted.

3,675,241
CRYSTAL BALL DISPLAY SYSTEM HAVING TOUCH CONTROLLED LIGHTS

David Glaser, 256 Greenbrook Road R. D. 2, Bound Brook, N.J.

Filed Oct. 29, 1970, Ser. No. 85,124
Int. Cl. G08b *5/36, 5/38*
U.S. Cl. 340—366 **1 Claim**



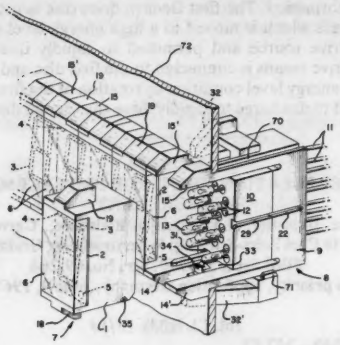
The display system includes a crystal ball having an operating circuit coupled thereto which includes electrode means in operative relation with the crystal ball and adapted to be energized by proximity or contact with the hands of an operator, whereby the associated circuit is energized and provides a desired response including, as an example, sequencing of lights. The circuit includes an amplifier operated by the electrode means connected (1) to means for energizing the lights and (2) to a multivibrator and flip-flop for sequencing the lights. The circuit includes a capacitor for storing charge and holding on one light after the operator removes his hands from the apparatus.

3,675,242
ALPHA-NUMERIC DISPLAY

Kemper Martel Hammell, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Feb. 25, 1970, Ser. No. 14,137
Int. Cl. G09f *9/30*
U.S. Cl. 340—381 **6 Claims**

The disclosure relates to an alpha-numeric light display capable of providing substantially uniform illumination over the entire character being illuminated and utilizing relatively low power requirement. This is accomplished, in part, by providing a reflector behind the lamp filament for each character element, the reflector being arranged to transmit most of the light reflected therefrom to the outer regions of the character element. The disclosure also includes provisions for cascading a plurality of the alpha-numeric light display elements to provide a snap-in, self supporting, heat dissipating multi alpha-numeric display.

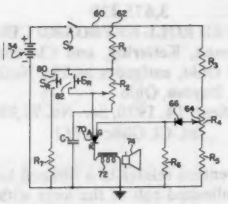


3,675,243
ELECTRONIC DRIP TIMING DEVICE

John F. Landuyt, Des Plaines, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Jan. 22, 1970, Ser. No. 4,967
Int. Cl. G08b *3/00;* **H03k** *3/31*
U.S. Cl. 340—384 E **8 Claims**

Electronic timing device for timing drips in intravenous feeding and similar systems can be adjusted to provide an audible or visible signal in accordance with any desired drip rate between about 4 and 300 drips per minute. The device overcomes the inherent deficiency of conventional electronic metronomes which are unsuitable for adjusting drip rates since they have a first pulse period different from the remainder. The first pulse period is of the exact length of the remaining pulse periods due to the presence of a circuit which can be maintained in a standby condition with its capacitor partially charged. This permits the pulse producing circuit to be actuated simultaneously with the visual observance by an operator of a drip passing a predetermined point. If the actual drop rate is different from the desired rate, the operator adjusts it and again actuates the timing device. This operation is repeated until the timing rate and the drip rate are synchronized. The device is battery operated and sufficiently small as to be easily carried around the neck or in the pocket of the person using it.

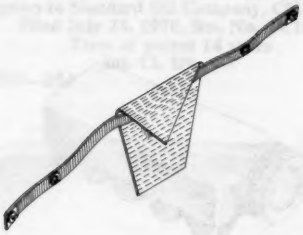


ERRATUM

For Class 343—225 see:
Patent No. 3,675,226

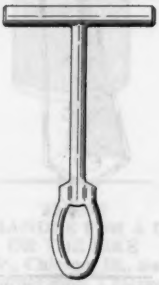
224,077
EXPANDED CEREAL FOOD PRODUCT
Leroy F. Duvall, Barrington, and Charles D. Stone, North Barrington, Ill., assignors to The Quaker Oats Company
Filed Dec. 8, 1970, Ser. No. 26,352
Term of patent 14 years
Int. Cl. D1—*01*
U.S. Cl. D1—1

224,078
PURSE FOR ATTACHMENT TO A BRA
Daniel Wise, Reading, Pa., assignor to Healthwear Underwear, Inc., Wernersville, Pa.
Filed Nov. 6, 1970, Ser. No. 25,859
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D2—400

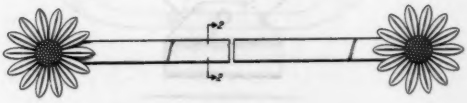


224,079
HIGH CHAIR
Charles L. Voytko, Johnstown, Pa., assignor to Hedstrom Company, Bedford, Pa.
Filed Feb. 16, 1971, Ser. No. 115,907
Term of patent 7 years
Int. Cl. D6—*02*
U.S. Cl. D6—8

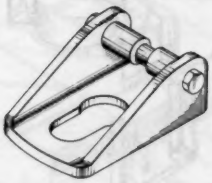
224,080
PULLING TOOL OR SIMILAR ARTICLE
Bruce F. Lawson, 2028 Angling Road, Corfu, N.Y. 14036
Filed Dec. 4, 1970, Ser. No. 26,281
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—14



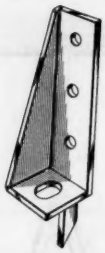
224,081
DRAPERY ROD
David M. Hadlow, Kensington, Conn., assignor to The Stanley Works, New Britain, Conn.
Filed Jan. 22, 1969, Ser. No. 15,456
Term of patent 14 years
Int. Cl. D8—*09*
U.S. Cl. D8—208



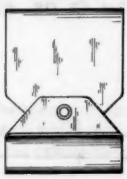
224,082
TIE-DOWN DEVICE
Frank Kolstee, Sr., 1819 S. Central, Kent, Wash. 98031
Filed Oct. 8, 1970, Ser. No. 25,391
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—229



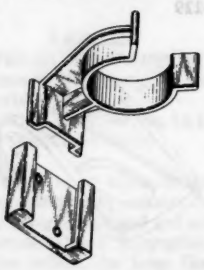
224,083
HOLDDOWN FOR ANCHORING WALL STUDS IN FRAME CONSTRUCTION TO BUILDING FOUNDATIONS
Tyrell T. Gilb, Berkeley, Calif., assignor to Simpson Company
Filed Oct. 30, 1970, Ser. No. 25,724
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—233



224,084
GUN SUPPORT
James F. Gaffney, 328 SE. 15th St., Pryor, Okla. 74361
Filed Nov. 18, 1970, Ser. No. 26,051
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—235

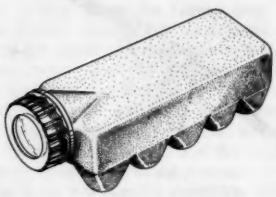


224,085
LIGHT SOCKET HOLDER
Angelo C. Cuva, 1024 Sumac Drive, Sunnyvale, Calif. 94086
Filed Sept. 29, 1969, Ser. No. 19,337
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—259



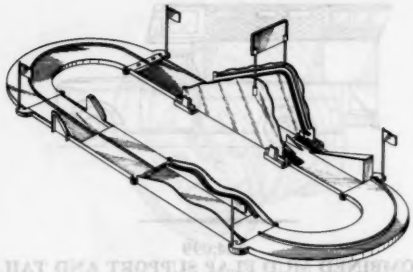
224,086
PIN
Sheldon Willis, 1230 NW. 187th St., Miami, Fla. 33169
Filed Apr. 9, 1971, Ser. No. 132,928
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—266

224,087
COMBINED BOTTLE AND ICE TRAY
Rikio Matsumoto, Kamakura, Japan, assignor to Asahi Engineering Co., Ltd., Sonyo Kako Co., Ltd., and Hitachi Ltd., Tokyo, Japan
Filed Oct. 30, 1970, Ser. No. 25,738
Term of patent 7 years
Int. Cl. D9—*01*
U.S. Cl. D9—10

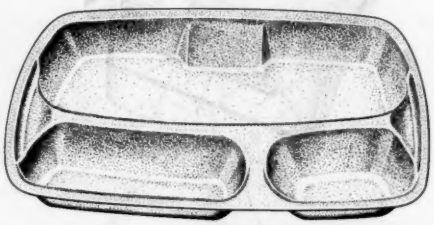


224,088
BOTTLE OR SIMILAR ARTICLE
Charles K. Huthsing, Jr., Libertyville, Ill.; N. Evelyn Huthsing, executor of said Charles K. Huthsing, Jr., deceased
Filed Sept. 29, 1970, Ser. No. 25,255
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—40

224,089
TOY TRACKWAY
Kazutaka Takeuchi, Narashino, Japan, assignor to Tomy Kogyo Co., Ltd., Tokyo, Japan
Filed Mar. 8, 1971, Ser. No. 122,290
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15

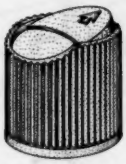


224,090
COMPARTMENTED COVER FOR A TRAY
Steve Cyr and Mark Whelan, Chippewa Falls, Wis., assignors to Standard Oil Company, Chicago, Ill.
Filed July 28, 1970, Ser. No. 24,185
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—254



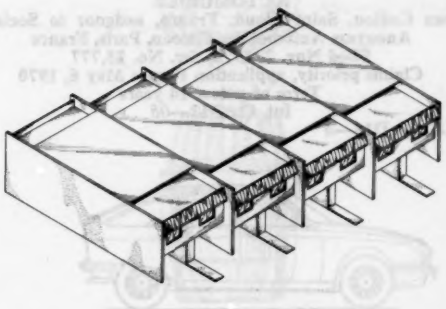
224,091
DISPENSING TOP FOR A CONTAINER
Peter Swartzbaugh, Toledo, Ohio, assignor to Abbott Laboratories, North Chicago, Ill.
Filed Nov. 10, 1970, Ser. No. 25,923
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—257

224,092
DISPENSING CLOSURE
Roy B. Steidley, Costa Mesa, Calif., assignor to RDW Industries, Inc., Santa Ana, Calif.
Filed Jan. 20, 1971, Ser. No. 108,244
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—258



224,093
CARRYING HANDLE FOR A CONTAINER OR THE LIKE
Elmer W. Griese, Jr., Chicago, Ill., assignor to National Can Corporation, Chicago, Ill.
Filed Apr. 20, 1970, Ser. No. 22,508
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D9—291

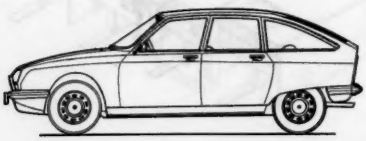
224,094
MULTIPLE DWELLING STRUCTURE
Hue R. Lee, 1353 W. Nancy Creek Drive NE., Atlanta, Ga. 30319
Filed Oct. 14, 1970, Ser. No. 25,480
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1



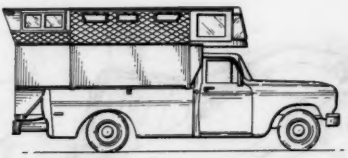
224,095
COMPONENT FOR GRILL WORKS, RAILINGS, COLUMNS AND THE LIKE
Ellis Deloy Larson, 225 E. State Road, Pleasant Grove, Utah 84062
Filed Mar. 1, 1971, Ser. No. 120,000
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D13—1

224,096
CART
Robert L. Propst, Ann Arbor, and James O. Kelley, Saline, Mich., assignors to Herman Miller Inc., Zeeland, Mich.
Filed Oct. 26, 1970, Ser. No. 25,631
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D14—3

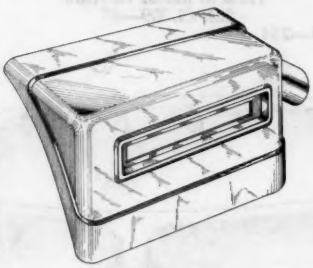
224,097
AUTOMOBILE
Jean Cadiou, Saint Cloud, France, assignor to Societe Anonyme Automobiles Citroen, Paris, France
Filed Nov. 2, 1970, Ser. No. 25,777
Claims priority, application France May 6, 1970
Term of patent 14 years
Int. Cl. D12—*08*
U.S. Cl. D14—3



224,098
CAMPER
Jimmy W. Ammons, Box 175, Magnum, Okla. 73554
Filed Nov. 13, 1970, Ser. No. 25,964
Term of patent 14 years
Int. Cl. D12—*10*
U.S. Cl. D14—3



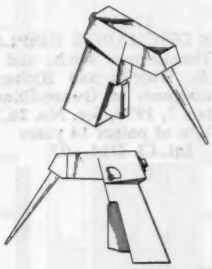
224,099
COMBINED MUD FLAP SUPPORT AND TAIL LIGHT HOLDER FOR TRUCKS
Robert J. Gaskins, 2777 Marina Blvd., San Leandro, Calif. 94577
Filed Dec. 7, 1970, Ser. No. 26,327
Term of patent 7 years
Int. Cl. D12—*16*
U.S. Cl. D14—6



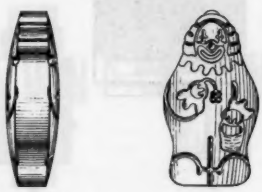
224,100
STEERING WHEEL RIM
Robert T. Mora, 1186 Emerson Ave., Campbell, Calif. 95008
Filed July 10, 1970, Ser. No. 24,240
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D14—30

224,101
WHEEL
Roy E. Richter, 9835 Wileyburke Ave., Downey, Calif. 90240
Filed Sept. 21, 1970, Ser. No. 25,084
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D14—30

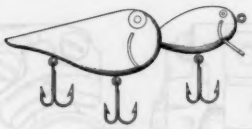
224,102
AUTOMATIC PIPETTE
Earl F. Raczak, Southampton, Pa., assignor to Bio/Data Corporation, Hatboro, Pa.
Filed Jan. 28, 1970, Ser. No. 21,222
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D16—2



224,103
VITAMIN TABLET OR SIMILAR ARTICLE
Robert R. Wiethop, Evansville, Ind., assignor to Mead Johnson and Company, Evansville, Ind.
Filed Apr. 2, 1971, Ser. No. 130,875
Term of patent 14 years
Int. Cl. D28—*01*; D1—*02*
U.S. Cl. D16—3



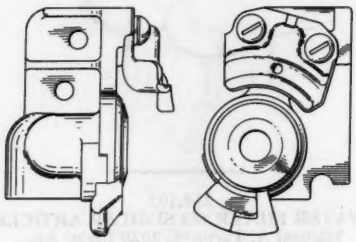
224,104
FISHING LURE
Donald K. Smith, 727 W. Outer Drive, Oak Ridge, Tenn. 37830
Filed Dec. 7, 1970, Ser. No. 26,313
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—28



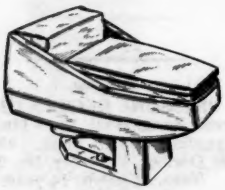
224,105
WATER FILTER OR SIMILAR ARTICLE
Michael A. Turturro, 2020 Idaho Ave., Santa Monica, Calif. 90403
Filed Dec. 11, 1970, Ser. No. 26,407
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—4

224,106
PRESSURE REGULATOR
Frank Baranowski, Jr., 7 Pine St., Lynnfield Center, Mass. 01940
Filed Dec. 15, 1970, Ser. No. 26,501
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—21

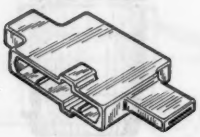
224,107
GLADHAND CONNECTOR
Victor Mastis, Hinsdale, Ill., assignor to The Berg Manufacturing Company, Des Plaines, Ill.
Filed July 28, 1970, Ser. No. 24,190
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—44



224,108
WATER CLOSET
Donald W. Doman, Janesville, Wis., assignor to Kohler Co., Kohler, Wis.
Filed Dec. 29, 1970, Ser. No. 26,687
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—65



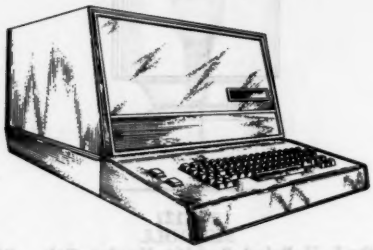
224,109
CONNECTOR SOCKET
Corliss O. Burandt, Hopkins, Minn., assignor to Thexton Manufacturing Company, St. Louis Park, Minn.
Filed Oct. 13, 1970, Ser. No. 25,475
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—1



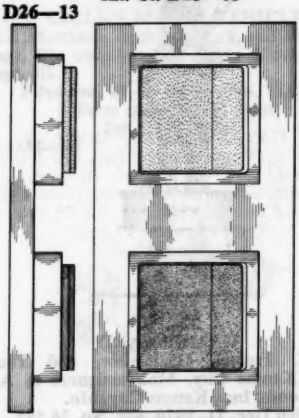
224,110
DATA DISPLAY CONSOLE
Richard F. Heimann, 179 Concord Road, Sudbury, Mass. 01776
Continuation-in-part of design application Ser. No. 21,170, Jan. 30, 1970. This application Dec. 2, 1970, Ser. No. 26,276
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5

224,111
MULTIPLE GAS DISCHARGE DISPLAY DEVICE
Fred E. Mansur, Temperance, Mich., and Larry J. Lohmann, Gerald E. Wojcik, and Richard A. Martel, Toledo, Ohio, assignors to Owens-Illinois, Inc.
Filed Dec. 7, 1970, Ser. No. 26,326
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5

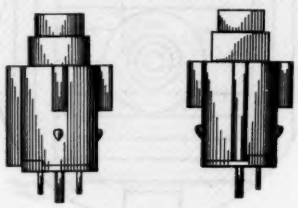
224,112
COMBINED DATA TERMINAL AND HARD COPY PRINTER
Carl J. Clement, Mountain View, Calif., assignor to Pholophysics, Inc., Mountain View, Calif.
Filed Jan. 22, 1971, Ser. No. 109,086
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5



224,113
FUSE PANEL
William L. Brown, Lake Zurich, Ill., assignor to Littelfuse, Inc., Des Plaines, Ill.
Filed Aug. 26, 1970, Ser. No. 24,695
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—13

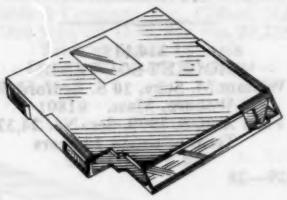


224,114
PUSH-BUTTON SWITCH
Edward G. Mueller, Kimball, Nebr., assignor to George Risk Industries, Inc., Kimball, Nebr.
Filed Aug. 26, 1970, Ser. No. 24,714
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—13

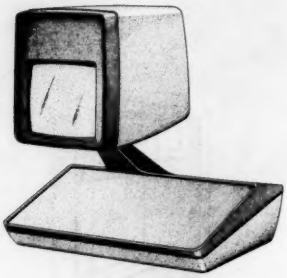


224,115
CONTROL STATION FOR PNEUMATIC TUBE SYSTEM
Herbert Kalendar, Hallandale, Fla., assignor to Advance Metal Products, Inc., Miami, Fla.
Filed Sept. 10, 1970, Ser. No. 24,910
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—13

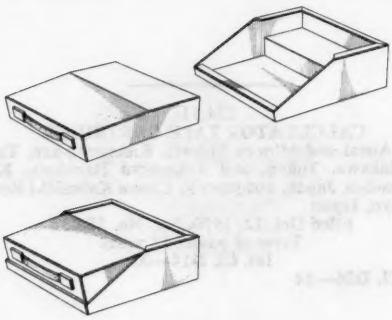
224,116
CALCULATOR TAPE CARTRIDGE
Shiro Anzai and Minoru Murata, Kanagawa-ken, Tatsuo Nishikawa, Tokyo, and Takamitsu Hanakata, Kanagawa-ken, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 12, 1970, Ser. No. 25,432
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—14



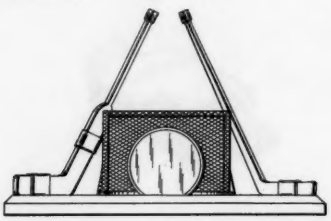
224,117
VIDEOTELEPHONE TRANSCEIVER
Donald Michael Genaro, Haworth, and Thomas Joseph Kelly, Middletown, N.J., John Neil McGarvey, Drexel Hill, Pa., and Rembert Ryan Stokes, Middletown, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Jan. 7, 1971, Ser. No. 104,830
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14



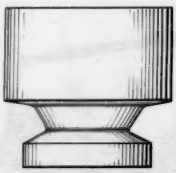
224,118
COMBINED BATTERY PACK AND CHARGER UNIT
George R. Hartz, Canoga Park, Calif., assignor to Berkey/Colortran Mfg., Inc., Burbank, Calif.
Filed Oct. 12, 1970, Ser. No. 25,453
Term of patent 14 years
Int. Cl. D13—*02*
U.S. Cl. D26—15



224,119
HOCKEY SOUVENIR
William M. Scire, 10 S. Bedford St., Woburn, Mass. 01801
Filed Aug. 5, 1970, Ser. No. 24,320
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D29—28

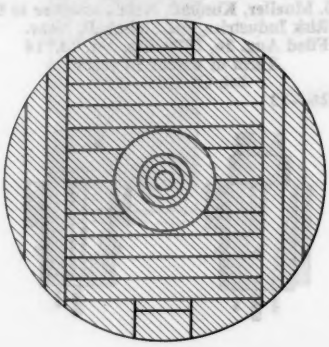


224,120
FLORAL VASE OR THE LIKE
Edwin K. Kaelke, Dundee, Ill., assignor to The Haeger Potteries, Inc., Dundee, Ill.
Filed Dec. 28, 1970, Ser. No. 26,670
Term of patent 7 years
Int. Cl. D11—*02*
U.S. Cl. D29—28



224,121
SKI DOLL
Martha L. H. Baierl, Box 164, Hayden, Colo. 81639
Filed Mar. 12, 1971, Ser. No. 123,930
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—4

224,122
GAME BOARD
Raymond F. Tremel, Grandview, and Thomas C. Christian, Kansas City, Mo., assignors to Ar-Ka-Mo Sporting Goods, Inc., Kansas City, Mo.
Filed Dec. 21, 1970, Ser. No. 26,595
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5

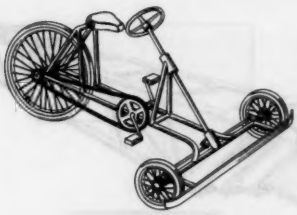


224,123
TWIRLING BATON
Donald L. Sartell, 328 Seminole Road, Janesville, Wis. 53545
Filed Jan. 20, 1971, Ser. No. 108,245
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5

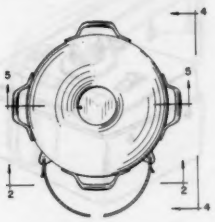
224,124
CHILD'S RIDING VEHICLE
Howard J. Morrison, Highland Park, and Marvin I. Glass, Chicago, Ill., assignors to Marvin Glass & Associates, Chicago, Ill.
Filed Jan. 29, 1971, Ser. No. 111,175
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15

224,125
SKI SCOOTER
Theodore D. Boganowski, 3059 S. 48th Ave., Omaha, Nebr. 68106
Filed Feb. 8, 1971, Ser. No. 113,794
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D34—15

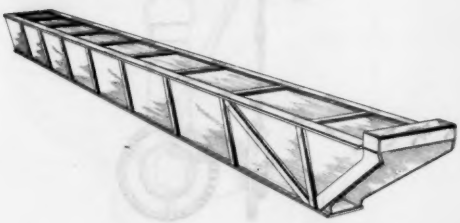
224,126
TRICYCLE
Peter Huley, 121 W. 13th St., North Vancouver, British Columbia, Canada
Filed Apr. 7, 1970, Ser. No. 22,301
Term of patent 7 years
Int. Cl. D12—*11*
U.S. Cl. D34—15



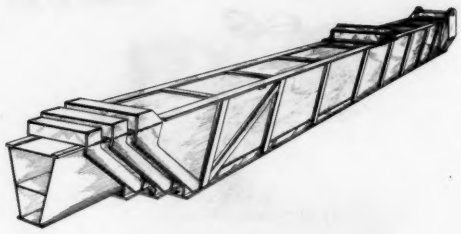
224,127
INFLATABLE SLED
Randolph L. Frank, 34808 Farragut, Westland, Mich. 48185
Filed Dec. 11, 1970, Ser. No. 26,424
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—15



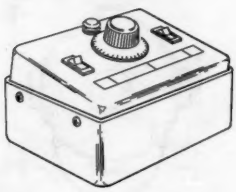
224,128
BOOM SECTION FOR A TELESCOPIC CRANE BOOM
Russell L. Sterner, Greencastle, Pa., assignor to Walter Kidde & Company, Inc., Clifton, N.J.
Filed Sept. 28, 1970, Ser. No. 25,215
Term of patent 14 years
Int. Cl. D12—*05*; D15—*04*
U.S. Cl. D41—1



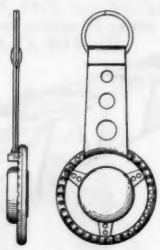
224,129
TELESCOPIC CRANE BOOM
Russell L. Sterner, Greencastle, Pa., assignor to Walter Kidde & Company, Inc., Clifton, N.J.
Filed Sept. 28, 1970, Ser. No. 25,216
Term of patent 14 years
Int. Cl. D12—*05*; D15—*04*
U.S. Cl. D41—1



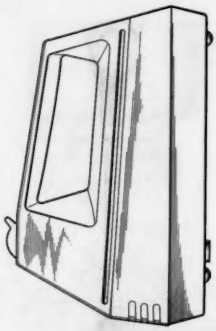
224,130
PHOTOGRAPHIC TIMER
Keith N. Swanson, 112 W. Cota St., Santa Barbara, Calif. 93101
Filed Aug. 31, 1970, Ser. No. 24,783
Term of patent 7 years
Int. Cl. D10—*03*
U.S. Cl. D42—7



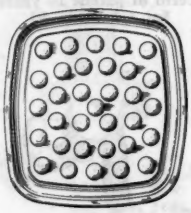
224,131
CASE FOR A PENDANT WATCH
Raymond Musy, La Chaux-de-Fonds, Switzerland, assignor to Accurist S.A., La Chaux-de-Fonds, Switzerland
Filed Oct. 19, 1970, Ser. No. 25,542
Claims priority, application Switzerland June 11, 1970
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D42—8



224,132
FOOD MIXER
Yasuaki Yamamoto, Tokyo, Japan, assignor to Janone Sewing Machine Co., Ltd., Tokyo, Japan
Filed June 26, 1970, Ser. No. 23,683
Claims priority, application Japan May 1, 1970
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D44—1



224,133
SINK PAD HOLDER OR THE LIKE
James B. Swett, Barrington, R.I., assignor to Dart Industries Inc., Los Angeles, Calif.
Filed Dec. 11, 1970, Ser. No. 26,413
Term of patent 14 years
Int. Cl. D7—*07*
U.S. Cl. D44—1

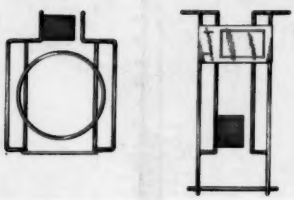


224,134
CANISTER
Charles H. Simpson, Phoenix, Ariz. (7029 E. Palm Lane, Scottsdale, Ariz. 85257)
Filed Nov. 18, 1970, Ser. No. 26,063
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D44—6

224,135
COVERED BOWL
Melvin Woodruff, Los Angeles, Calif., assignor to Watts Manufacturing Company, Compton, Calif.
Filed Oct. 16, 1970, Ser. No. 25,523
Term of patent 3½ years
Int. Cl. D7—*01*
U.S. Cl. D44—15

224,136
PLATE OR THE LIKE
Gregory Mirow, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.
Filed Dec. 4, 1970, Ser. No. 26,282
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D44—15

224,137
MILK CARTON HOLDER
Vincent B. Steffen, 321 E. Hamilton, New Hampton, Iowa 50659
Filed Oct. 26, 1970, Ser. No. 25,658
Term of patent 14 years
Int. Cl. D7—*999*
U.S. Cl. D44—21



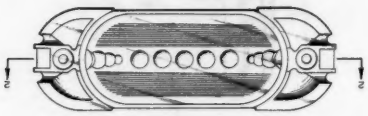
224,138
MAT
Kenneth Mahler, 722 Carew Tower, Cincinnati, Ohio 45202
Filed June 7, 1971, Ser. No. 150,880
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D44—31

224,139
TABLE LAMP
Luciano Annichini, Via Roma 9, Turate, Como, Italy
Filed Sept. 14, 1970, Ser. No. 24,983
Claims priority, application Italy Mar. 16, 1970
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—20

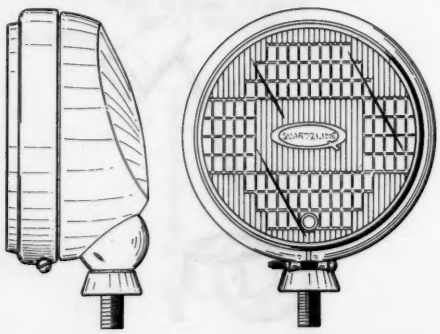
224,140
LAMP
Phillip Purer, Beverly Hills, Calif., assignor to Victory-Puretec, Inc., Culver City, Calif.
Filed Feb. 22, 1971, Ser. No. 117,878
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—20

224,141
LAMP
Edward Sexton, Healdsburg, Calif., assignor to The Third Eye, Inc., New York, N.Y.
Filed Feb. 25, 1971, Ser. No. 119,083
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—20

224,142
VEHICLE MARKER LIGHT LENS
George A. Knapp, Syracuse, N.Y., assignor to R. E. Dietz Company, Syracuse, N.Y.
Filed Nov. 2, 1970, Ser. No. 25,788
Term of patent 14 years
Int. Cl. D26—*06*
U.S. Cl. D48—32



224,143
VEHICLE AUXILIARY LAMP
Douglas R. Cleminshaw and Robert G. Wells, Syracuse, N.Y., assignors to R. E. Dietz Company, Syracuse, N.Y.
Filed Sept. 15, 1970, Ser. No. 24,999
Term of patent 14 years
Int. Cl. D26—*06*
U.S. Cl. D48—32



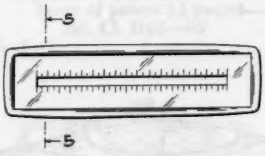
224,144
REFUSE CAN STAND
Julian J. Acree, P.O. Box 668, Okmulgee, Okla. 74447
Filed Feb. 16, 1971, Ser. No. 115,930
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D49—30

224,145
VENDING MACHINE
Cecil F. Ussery, Dallas, Tex., assignor to Ussery Industries, Inc., Dallas, Tex.
Filed Nov. 18, 1970, Ser. No. 26,053
Term of patent 14 years
Int. Cl. D20—*01*
U.S. Cl. D52—3

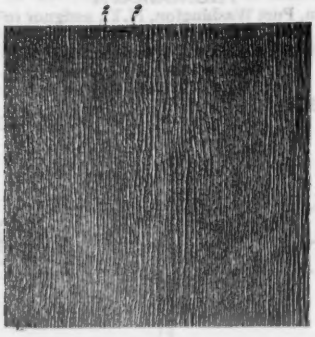
224,146
HEIGHT GAUGE
Nicholas M. Milan, 21664 Newcastle, Harper Woods, Mich. 48236
Filed Mar. 18, 1971, Ser. No. 125,924
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D52—6

224,147
DIGITAL THERMOMETER
M. Louis Miller, Westfield, N.J., assignor to Victory Engineering Corporation, Springfield, N.J.
Filed Mar. 9, 1970, Ser. No. 21,827
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D52—7

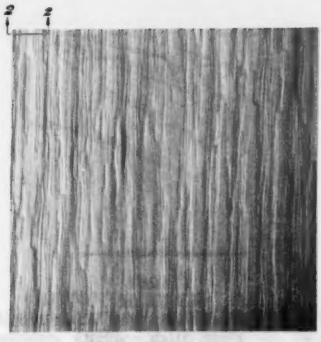
224,148
THERMOMETER
Russell A. Walter, 8890 Echo Lake Drive NE. 44484, and James C. Salsgiver, 1857 Bonnie Brae NE. 44483, both of Warren, Ohio
Filed Feb. 25, 1971, Ser. No. 119,085
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D52—7



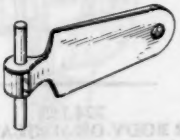
224,149
ARCHITECTURAL PANEL
Roland R. Sahm, Palos Verdes Estates, Calif., assignor to Elixir Industries, Gardena, Calif.
Filed Aug. 31, 1970, Ser. No. 24,788
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D54—2



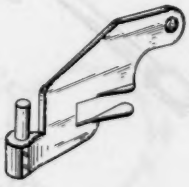
224,150
ARCHITECTURAL PANEL
Roland R. Sahm, Palos Verdes Estates, Calif., assignor to Elixir Industries, Gardena, Calif.
Filed Aug. 31, 1970, Ser. No. 24,789
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D54—2



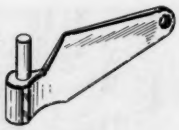
224,151
INSERT ROLL HOLD DOWN
James M. Lapeyre, 13 Richmond Place, New Orleans, La. 70115
Filed Oct. 21, 1970, Ser. No. 25,570
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D55—1



224,152
INSERT ROLL HOLD DOWN
James M. Lapeyre, 13 Richmond Place, New Orleans, La. 70115
Filed Oct. 20, 1970, Ser. No. 25,571
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D55—1

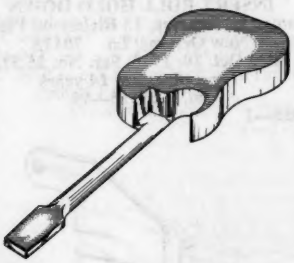


224,153
INSERT ROLL HOLD DOWN
James M. Lapeyre, 13 Richmond Place, New Orleans, La. 70115
Filed Oct. 21, 1970, Ser. No. 25,572
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D55—1

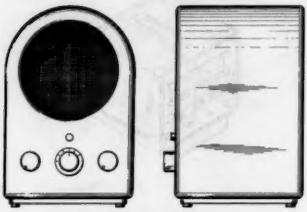


224,154
GUITAR
Clifford W. Gilbert, 910 Watson St., Flint, Mich. 48503
Filed Oct. 12, 1970, Ser. No. 25,447
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D56—1

224,155
GUITAR BODY OR SIMILAR ARTICLE
Ralph G. Smith, 1420 Georgia St., Wichita, Kans. 67216
Filed Dec. 16, 1970, Ser. No. 26,526
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D56—1



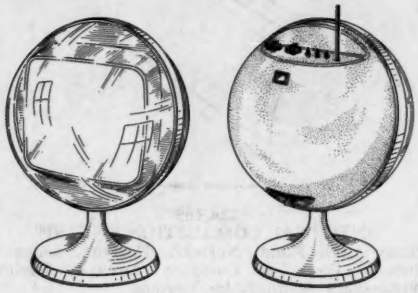
224,156
RADIO CABINET
George L. L. Hunter, 353 Kearny St., San Francisco, Calif. 94108
Filed Aug. 13, 1970, Ser. No. 24,464
Term of patent 3½ years
Int. Cl. D14—*03*
U.S. Cl. D56—4



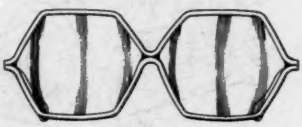
224,157
COMBINED RADIO-PHONOGRAPH AND TAPE PLAYER OR SIMILAR ARTICLE
Carl Yurdin, Port Washington, N.Y., assignor to Harman-Kardon, Incorporated, Plainview, N.Y.
Filed Mar. 3, 1971, Ser. No. 120,787
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D56—4

224,158
PHONOGRAPH
Carl Yurdin, Port Washington, N.Y., assignor to Harman-Kardon, Incorporated, Plainview, N.Y.
Filed Mar. 3, 1971, Ser. No. 120,786
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D56—4

224,159
TELEVISION RECEIVER
Donald S. Griffin, Kitchener, Ontario, Canada, assignor to Electrohome Limited, Kitchener, Ontario, Canada
Filed Apr. 7, 1971, Ser. No. 132,246
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D56—4

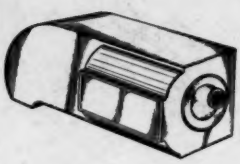


224,160
PAIR OF SPECTACLES
Jack Bloch, Leominster, Mass., assignor to Foster Grant Co., Inc., Leominster, Mass.
Filed Sept. 10, 1970, Ser. No. 24,927
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D57—1

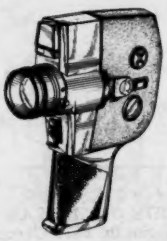


224,161
HOUSING FOR A COMBINED RADIO RECEIVER AND RECORD PLAYER OR SIMILAR ARTICLE
Harvey K. McQuarrie, Kitchener, Ontario, Canada, assignor to Electrohome Limited, Kitchener, Ontario, Canada
Original design application June 15, 1970, Ser. No. 23,476. Divided and this application May 27, 1971, Ser. No. 147,713
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D56—4

224,162
MOTION PICTURE CAMERA HOUSING
Walter H. Bach, 1771 N. Crescent Heights Blvd., Los Angeles, Calif. 90069
Filed Sept. 22, 1970, Ser. No. 25,135
Term of patent 14 years
Int. Cl. D16—*01*
U.S. Cl. D61—1

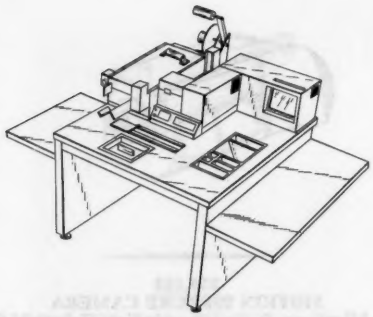


224,163
MOTION PICTURE CAMERA
Shigeo Mizukawa, % Fuji Shashin Koki Kabushiki Kaisha, 324, 1-chome, Uetake-cho, Ohmiya-shi, Saitama-ken, and Mashihiro Fukuda, % Fuji Shashin Film Kabushiki Kaisha, 26–30, 2-chome, Nishiazabu, Minato-ku, both of Tokyo, Japan
Filed Feb. 1, 1971, Ser. No. 111,778
Claims priority, application Japan Aug. 1, 1970
Term of patent 14 years
Int. Cl. D16—*01*
U.S. Cl. D61—1

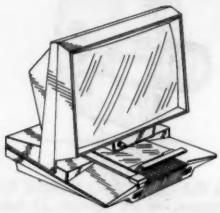


224,164
CAMERA FOCUSSING HANDLE
Kazuo Goto, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo-to, Japan
Filed Feb. 26, 1971, Ser. No. 119,453
Claims priority, application Japan Sept. 25, 1970
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D61—1

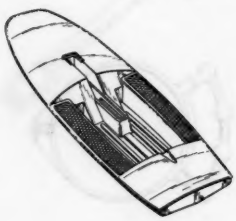
224,165
PHOTOFINISHING CONSOLE
Thomas C. Laughon, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Mar. 15, 1971, Ser. No. 124,642
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D61—1



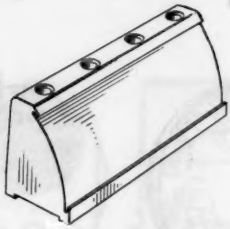
224,166
MICROFICHE VIEWER
Lewis E. Simpson, Inglewood, Calif., assignor to Dioptrix, Inc., La Jolla, Calif.
Filed Apr. 6, 1971, Ser. No. 131,853
Term of patent 14 years
Int. Cl. D16—*02*
U.S. Cl. D61—1



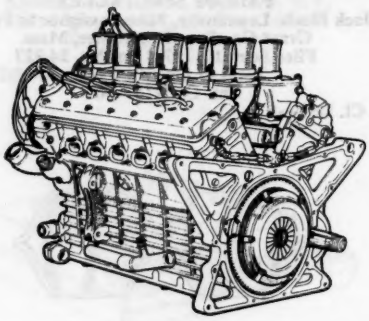
224,167
SAIL BOAT HULL
Douglas Ben Ian Proctor, "Fenmead," Brook Ave., Warsash, Southampton, England
Filed Oct. 12, 1970, Ser. No. 25,433
Claims priority, application Great Britain Apr. 10, 1970
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D71—1



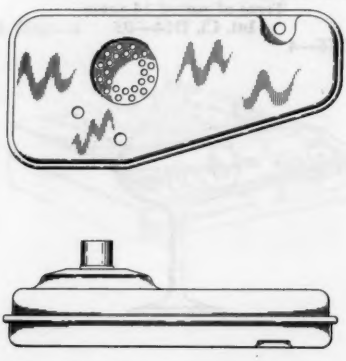
224,168
HOLDER FOR PENS AND PICTURES
Russell H. Hooker, Box 359, Southold, N.Y. 11971
Filed Oct. 14, 1970, Ser. No. 25,486
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D74—5



224,169
INTERNAL COMBUSTION ENGINE
Anthony Cyril Rudd, Norwich, England, assignor to Rubery, Owen & Company Limited, Darlaston, Wednesbury, Staffordshire, England
Filed Aug. 21, 1970, Ser. No. 24,637
Claims priority, application Great Britain Feb. 24, 1970
Term of patent 14 years
Int. Cl. D15—*01*
U.S. Cl. D77—1

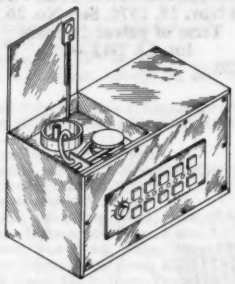


224,170
MUFFLER
Douglas Gordon, Hartford, Wis., assignor to Briggs & Stratton Corporation, Milwaukee, Wis.
Filed Apr. 19, 1971, Ser. No. 135,532
Term of patent 14 years
Int. Cl. D15—*01*
U.S. Cl. D77—1

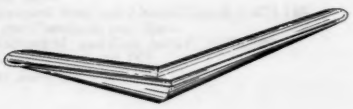


224,171
FOOD BAR
Glen C. Hancock, Sarasota, Fla., and W. Terry Young, Charlotte, N.C., assignors to Shoney's South, Inc., Memphis, Tenn.
Filed Oct. 6, 1970, Ser. No. 25,359
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D80—2

224,172
DIALYZING UNIT
Clarence E. Schmidt, Santa Ana, Calif. (10510 Chapman Ave., Suite 12, Garden Grove, Calif. 92640)
Filed May 13, 1970, Ser. No. 22,962
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D83—1

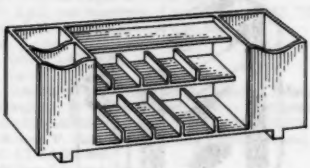


224,173
TONGUE DEPRESSOR
Arthur John Clifford, "Cheam," Clarkmont Road, Sassafras, Victoria, Australia
Filed Sept. 4, 1970, Ser. No. 24,844
Claims priority, application Australia Mar. 13, 1970
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D83—12

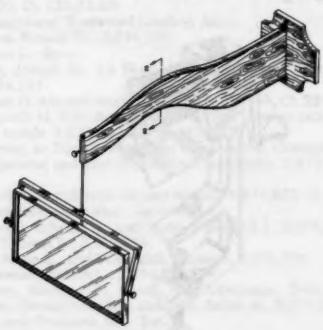


224,174
CIGARETTE HOLDER OR SIMILAR ARTICLE
William R. Holden, 2109 Pullman Lane, Redondo Beach, Calif. 90278
Filed Dec. 8, 1970, Ser. No. 26,354
Term of patent 14 years
Int. Cl. D27—*02*
U.S. Cl. D85—8

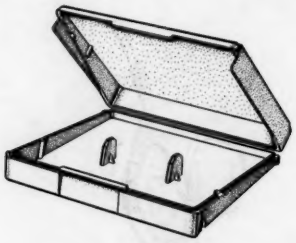
224,175
COSMETIC VANITY TRAY
Rebecca Mark, 195 Turn of River Road, Stamford, Conn. 06905
Filed Oct. 12, 1970, Ser. No. 25,439
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D86—10



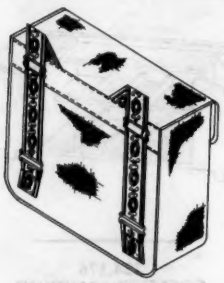
224,176
COSMETIC MIRROR
Vivian S. Spencer, 130 S. Greenwich Road, Wichita, Kans. 67207
Filed Sept. 11, 1970, Ser. No. 24,946
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—10



224,177
TAPE CASSETTE BOX
Robert S. Wallace, 2706 S. Robertson Blvd., Los Angeles, Calif. 90034
Filed Apr. 10, 1970, Ser. No. 22,364
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D87—1

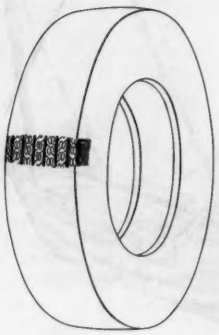


224,178
KNAPSACK
Helen H. Bryant, 2801 Gardner Park Drive, Gastonia, N.C. 28053
Continuation-in-part of design application Ser. No. 22,008, Mar. 23, 1970. This application Sept. 9, 1970, Ser. No. 24,894
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D87—1

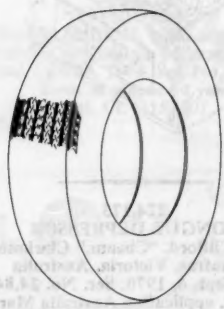


224,179
SHELLER FOR PEAS OR THE LIKE
George F. Taylor, P.O. Box 625, Moultrie, Ga. 31768
Filed Nov. 23, 1970, Ser. No. 26,113
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D89—1

224,180
PNEUMATIC TIRE
Arthur C. Blankenship, Detroit, Mich., assignor to Uniroyal, Inc., New York, N.Y.
Filed May 3, 1971, Ser. No. 139,996
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D90—20



224,181
PNEUMATIC TIRE
William K. Pope, Detroit, Mich., assignor to Uniroyal, Inc., New York, N.Y.
Filed Nov. 25, 1970, Ser. No. 26,302
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D90—20



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 4TH DAY OF JULY, 1972

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

AB Billingsfors-Langed: *See—*
Persson, Leif R., 3,674,594.

Abbott Laboratories: *See—*
Kurath, Paul, 3,674,773.

Abbott, Terence Arnold: *See—*
Shephard, Robert Basil; Clachan, Margaret Loudon; Kennedy, David Rankine; and Abbott, Terence Arnold, 3,674,531.

Abele, Manlio G., to General Applied Science Laboratories, Inc. Microwave repeater. 3,675,128, Cl. 325-1.000.

Ablad, Bengt Arne: *See—*
Brandstrom, Arne Elof; Carlsson, Per Arvid Emil; Carlsson, Stig Ake Ingemar; Corrodi, Hans Rudolf; Ek, Lars; Lamm, Bo Robert; and Ablad, Bengt Arne, 3,674,840.

Abplanalp, George W.; and Corson, Steve. Blocking circuit for inboard engine ignition. 3,675,034, Cl. 307-9.000.

Abraham, Bruce C.; Fegley, Charles R.; and Lougher, George B., III, to Western Electric Company, Incorporated. Article handling with fluid ejection. 3,674,141, Cl. 209-74.000.

Abrahams, Louis: *See—*
Waters, James L.; Abrahams, Louis; and Hutchins, Burleigh M., Jr., 3,674,373.

ACF Industries, Incorporated: *See—*
Randolph, Robert W.; and Dare, Roy R., 3,673,914.

Ackerman, Howard T.; and Kessler, Clarence W., to National Cash Register Company, The. Unlimited roll keyboard circuit. 3,675,239, Cl. 340-365.000.

Ackerman, Tracy R.; and Schickler, John F., to General Motors Corporation. Flow process. 3,674,087, Cl. 165-2.000.

Adam, Robert; and Keefer, Dayle. Setting device for a boring tool. 3,673,694, Cl. 33-185.00r.

Adams, Gerald E., to Uniroyal, Inc. Toothed power transmission belt and method of manufacturing the same. 3,673,883, Cl. 74-233.000.

Adams, Jay C.; and Cook, Russell E., to Ranco Incorporated. Control device for pressure lubricated compressors. 3,673,811, Cl. 62-158.000.

Adams, John S.: *See—*
Ladin, Eli M.; Kegerise, Harry L.; and Adams, John S., 3,674,357.

Adams, Richard T.: *See—*
Stawarski, Chester C.; Gerding, Charles C.; and Adams, Richard T., 3,673,869.

Adams, Robert H., to Lockheed Aircraft Corporation. Modular solid-state power amplifier. 3,675,141, Cl. 330-13.000.

Addabbo, Nunzio P. Aircraft navigational calculator. 3,674,987, Cl. 235-88.000.

Addressograph-Multigraph Corporation: *See—*
Blanchette, Robert G., 3,674,473.

Advaced Patent Technology, Inc.: *See—*
Snaper, Alvin A.; Gregory, George D.; and Munroe, Miles R., 3,675,220.

Agence Nationale de Valorisation de la Recherche (Anvar): *See—*
Globus, Anatol; Duplex, Paul; and Vautier, Roger, 3,674,218.

Agfa-Gevaert: *See—*
Lambrechts, Jan Bernard, 3,674,588.
Vrancken, Marcel Nicolas; Brinckman, Eric Maria; and Heugebaert, Frans Clement, 3,674,483.

Agfa-Gevaert Aktiengesellschaft: *See—*
Kampfer, Helmut; von Konig, Anita; Ranz, Erwin; von Rintelen, Harald; Mayer, Dietmar; and Sasse, Klaus, 3,674,479.
Kampfer, Helmut; Von Konig, Anita; Ranz, Erwin; von Ritelen, Harald; Mayer, Dietmar; and Sasse, Klaus, 3,674,480.
Kohler, Roland; Nagel, Erich; Hujer, Friedrich; and Viehrig, Wolfgang, 3,674,365.
Matejec, Reinhart, 3,674,490.
Moll, Franz; Posse, Rolf-Fred; and Ringe, Werner, 3,674,703.
Theer, Anton, 3,674,349.
von Konig, Anita; Liebe, Werner; and Timmler, Helmut, 3,674,481.

Aggias, Zissis, to Henkel & Cie G.m.b.H. Internally plasticized epoxide resins of triglycidyl isocyanurate, hydroxy functional urethane polymer and polycarboxylic acid anhydride. 3,674,892, Cl. 260-835.000.

Agri-Tech, Inc.: *See—*
Hoover, Richard D.; and Kohler, George O., 3,674,770.

Ahland, Erwin: *See—*
Schmalfeld, Paul; Janssen, Heinrich; Bock, Burkhard; Peters, Werner; and Ahland, Erwin, 3,674,449.

Ahmed, Kamal: *See—*
Startin, Kenneth John; and Ahmed, Kamal, 3,675,188.

Air Products and Chemicals, Inc.: *See—*
Barrer, Richard M.; and Cole, John F., 3,674,709.
Uffner, Melville W., 3,674,757.

Airich, Gustav: *See—*
Eirich, Wilhelm; and Airich, Gustav, 3,674,241.

Aisin Seiki Kabushiki Kaisha: *See—*
Ono, Takeshi, 3,673,971.

A.I.T. Industries, Inc.: *See—*
Stern, Theodore J., 3,673,738.

Aitken, Thomas; Anderson, Donald R.; and Jursich, Myron J., to Nalco Chemical Company. Cationization of starch for filler retention utilizing a cationic polyepihalohydrin-tertiary amine polymer. 3,674,725, Cl. 260-9.000.

Ajax Tool Works, Inc.: *See—*
Benedict, Neil W., Jr., 3,673,686.

Ajinomoto Co., Inc.: *See—*
Ikeda, Shigeho; Ishizaki, Ayaaki; Hirose, Yoshio; and Shiro, Teruo, 3,674,639.

Akatsu, Mitsuhiro: *See—*
Inaba, Shigeho; Akatsu, Mitsuhiro; and Yamamoto, Hisao, 3,674,808.

Akira, Fukami: *See—*
Shunichiro, Nishizaki; and Akira, Fukami, 3,674,741.

Akiyama, Susumu; and Naganuma, Mitsuaki, to Nippon Electric Company, Limited. Demodulation system regenerating carrier waves phase synchronized with corresponding carrier wave components in horizontal synchronizing pulse modulated carrier waves. 3,674,929, Cl. 178-7.30r.

Akron Spool and Manufacturing Co.: *See—*
Hawley, John B., 3,674,069.

Aktiebolaget Atomenergi: *See—*
Holmer, Bernt Arne Gustaf, 3,674,006.

Aktiebolaget Hassle: *See—*
Brandstrom, Arne Elof; Carlsson, Per Arvid Emil; Carlsson, Stig Ake Ingemar; Corrodi, Hans Rudolf; Ek, Lars; Lamm, Bo Robert; and Ablad, Bengt Arne, 3,674,840.

Aktiebolaget Svenska Icopalfabriken, mesne: *See—*
Bokvist, Kjell; and Ingestrom, Curt Holger, 3,673,750.

Aktiengesellschaft Brown, Boveri & Cie: *See—*
Jaecklin, Andre, 3,675,125.
Kaser, Alfred, 3,673,653.

Akzo N.V.: *See—*
Brants, Johannes Petrus; and Van der Meulen, Johan, 3,674,522.

Aladjem, Abraham, to Israel Atomic Energy Commission, State of. Metal oxide film structure. 3,675,021, Cl. 250-106.00s.

Albertson, Robert V. Combined building humidifier and clothes dryer. 3,673,701, Cl. 34-90.000.

Albright & Wilson Limited: *See—*
Lyde, Derek Martin, 3,674,660.

Albright, Charles Jere. Multiple facilities for assembling cooking and dispensing food-products. 3,673,948, Cl. 99-55.000.

Alco Standard Corporation: *See—*
Moreau, Glenn T.; and Bielefeldt, Irvin P., 3,673,678.

Alder, Hanspeter, to Du Pont de Nemours, E. I., and Company. Process for preparing copper sulfide voltaic cell cathodes. 3,674,560, Cl. 136-23.000.

Aldridge, Gerald Richard; Ehrich, Felix Frederick; and Struve, William Scott, to Du Pont de Nemours, E. I., and Company. Preparation of dihydrotherephthalates. 3,674,814, Cl. 260-396.00n.

Alexakis, Nicholas George: *See—*
Block, Donald Edmund; and Alexakis, Nicholas George, 3,675,210.

Alfieri, Giulio, to Officine Alfieri Maserati. Internal combustion engines with at least two rows of cylinders with overhead camshafts. 3,673,990, Cl. 123-52.00r.

Allcock Laight and Westwood Limited: *See—*
Parsons, Ronald W., 3,674,293.

Allen, Glenn L.: *See—*
Marks, Joseph D.; Le Beck, Norman G.; and Allen, Glenn L., 3,674,181.

Allen, Julian H. Aircraft storage hangar. 3,673,749, Cl. 52-73.000.

Allen, Kenneth M. Circular stair with central support and disc spacers between treads. 3,673,752, Cl. 52-187.000.

Allen, Merton, to Environment/One Corporation. Controlled environment apparatus and process for plant husbandry. 3,673,733, Cl. 47-58.000.

Allen, Randy B. Amphibian camper vehicle. 3,673,622, Cl. 9-1.00t.

Allied Chemical Corporation: *See—*
Degginger, Edward R.; and Goetz, Frederick J., 3,674,878.
Lohr, Thomas E., 3,674,284.
Price, Alson K.; and Sukornick, Bernard, 3,674,798.
Stephenson, Robert L., 3,674,059.
Sweeney, Richard F.; Khan, Aziz Urrehman; Price, Alson K.; Jones, Edward Stephen; and Otto, Julian A., 3,674,800.

Allied Research Products, Inc.: *See—*
Mallory, Glenn O., 3,674,550.

Allied Tube & Conduit Corporation: *See—*
Dunbar, Glenn G., 3,674,166.
Krengel, Theodore H.; and Pool, Richard L., 3,673,980.

Allis-Chalmers Manufacturing Company: *See—*
Attia, Edward A.; and Dethlefsen, Rolf, 3,674,958.
Berg, David A., 3,674,096.
Clark, Thomas F., 3,674,959.
Crooks, James W., 3,673,890.
Dreisin, Alexander, 3,673,996.
Erni, Heinrich H., 3,674,956.
Manion, Jean P.; and Davies, Daniel J., 3,674,667.
Peek, Henry L., 3,674,955.

Allison, Arthur F.; Greening, Donald J.; and Mollgaard, Anton N., to Cutler-Hammer, Inc. Single-phase full-wave regenerative SCR shunt motor control system. 3,675,104, Cl. 318-345.000.

Allison, Donald B.: *See—*
Yates, Kenneth, 3,674,913.

Allport, Walter F., to International Paper Company. Method for the preparation of integrated nettings and laminates. 3,674,583, Cl. 156-167.000.

Allport, Walter F., to International Paper Company. Apparatus for the preparation of integrated nettings and laminates. 3,674,607, Cl. 156-511.000.

Allum, Keith George; and Hancock, Ronald David. Modified polyalcohol. 3,674,768, Cl. 260-91.3.

Alperovich, Viktor Borisovich; and Prut, Alfred Iosifovich. Pitot tube probe for taking total head and static pressure of air flow. 3,673,866, Cl. 73-212.000.

Alt, Gerhard H., to Monsanto Company. Phytotoxic compositions. 3,674,459, Cl. 71-18.000.

Aluminium Delfzijl N.V.: *See—*
Arts, Mathieu Gerardus Henricus; Lucker, Jan Anna Antonius; and Groenenboom, Maarten, 3,674,674.

Aluminum Company of America: *See—*
Brown, Melvin Henry, 3,674,652.
Brown, Robert H.; Anderson, William A.; and King, William, 3,674,448.

American Can Company: *See—*
Canamero, Ernest V.; and Ullmann, Christoph, 3,673,760.

American Cyanamid Company: *See—*
Berkelhammer, Gerald; Asato, Goro; and Moon, Edward Leslie, 3,674,780.
Schoenbrunn, Erwin Frederick; and Sinha, Vinod Tarkeshwar, 3,674,848.

American Hoist & Derrick Company: *See—*
Crook, Edward J., Jr., 3,674,301.

American Home Products Corporation: *See—*
Wolf, Milton; and Diebold, James L., 3,674,790.

American Micro-Systems, Inc., mesne: *See—*
Myers, William N., Jr., 3,674,917.

American Multi-Lert Corporation: *See—*
Scoville, Andrew E., 3,674,950.

American Optical Corporation: *See—*
Berkovits, Barouh V., 3,674,015.
Deeg, Emil W.; and Graf, Robert E., 3,674,530.
Goldberg, Herbert E., 3,674,018.
Laliberte, Norman U., 3,674,587.
Landry, Robert J.; and Snitzer, Elias, 3,675,155.
Polanyi, Michael L., 3,674,013.
Sage, Stanley J., 3,674,012.
Strack, Richard R., 3,674,452.
Young, Charles Gilbert, 3,675,152.

American Science & Engineering: *See—*
Cavalucci, Ralph; and Walters, John, 3,673,706.

Amersil Inc.: *See—*
Jung, Lothar, 3,674,904.

Ames, Horace L.: *See—*
Stanley, Robert W.; Ames, Horace L.; and Jennings, Peter H., 3,674,424.

AMF Incorporated: *See—*
Sicard, Marcel Clarence, 3,674,154.

Amidon, Roger W.; and Gencarelli, Richard A., to Uniroyal, Inc. Long chain hydrocarbon dithiocarbamate accelerators and method of making same. 3,674,824, Cl. 260-429.00k.

Amole, Inc., mesne: *See—*
Lala, Louis A., 3,673,954.

AMP Incorporated: *See—*
Demler, Henry William, Sr., 3,674,292.
Hammell, Kemper Martel, 3,675,242.

AMP Incorporated, mesne: *See—*
Kindell, Colin David, 3,673,643.
Podmore, Alan William Ronald, 3,675,180.
Startin, Kenneth John; and Ahmed, Kamal, 3,675,188.
van de Kerkhof, Lodevicus Lambertus Johannes, 3,673,847.

Anderson, Charles C. Fish and game receptacle. 3,674,188, Cl. 224-5.00g.

Anderson, Donald R.: *See—*
Aitken, Thomas; Anderson, Donald R.; and Jursich, Myron J., 3,674,725.

Anderson, George C. Support device for concrete reinforcing bars. 3,673,753, Cl. 52-685.000.

Anderson, James: *See—*
Gaudry, Paul E.; Gaudry, Edouard; Descarries, Raymond; and Anderson, James, 3,673,628.

Anderson, John Ray; and Hollingworth, Richard Peck, to Sybron Corporation. Removal of copper from aqueous solutions with highly stressed, activated ferrous metals. 3,674,466, Cl. 75-109.000.

Anderson, Robert Bernard: *See—*
Pieters, William Johan Meindert; Freel, John; and Anderson, Robert Bernard, 3,674,707.

Anderson, Robert V.; and Hagelbarger, David W., to Bell Telephone Laboratories, Incorporated. Keyboard encoding arrangement. 3,675,240, Cl. 340-365.000.

Anderson, William A.: *See—*
Brown, Robert H.; Anderson, William A.; and King, William, 3,674,448.

Ando, Sadanao, to Kabushiki Kaisha Ricoh. Exposure and development device for wet-type electrostatic photography. 3,674,362, Cl. 355-10.000.

Andresen, Otto: *See—*
Aunstrup, Knud; Andresen, Otto; and Outtrup, Helle, 3,674,643.

Andrew, Kenneth F.: *See—*
Gulbrasen, Earl A.; Tallman, Richard L.; Andrew, Kenneth F.; and Buzalski, Bruce T., 3,675,004.

Andros, Arthur A., to Monsanto Europe S.A., mesne. Plastic containers. 3,674,512, Cl. 99-178.000.

Angelica Corporation: *See—*
Hardy, John C., 3,674,034.

Angelo, Rudolph John, to Du Pont de Nemours, E. I., and Company. Insulated electrical conductor. 3,674,627, Cl. 161-175.000.

Angelucci, Romano, to Erba, Carlo, S.p.A. Process for stabilizing preparation of interfering viruses. 3,674,864, Cl. 424-90.

Annis, Rupert E., Jr.; and Kyritsis, William T., to USM Corporation. Apparatus for injection molding articles of foam material. 3,674,401, Cl. 425-244.000.

Anspon, Harry D.; Clampitt, Bert H.; and Gilbert, Ronald E., to Gulf Research & Development Company. Method for the preparation of ethylene-carboxylic acid copolymers. 3,674,761, Cl. 260-87.300.

Anthony, Andrew J.; Gaines, Albert L.; and Krawiec, Donald M., to Combustion Engineering, Inc. Bimetallic spacer grid. 3,674,635, Cl. 176-78.000.

Anthony, Russell W.: *See—*
Daniel, David W.; and Anthony, Russell W., 3,673,887.

Anthony, William H.: *See—*
Pryor, Michael J.; and Anthony, William H., 3,674,569.

Aono, Shigeo; Manaka, Nobuzi; and Inagaki, Tokuichi, to Nissan Motor Company, Limited. Acceleration actuating device for fuel injection system. 3,673,989, Cl. 123-32.0ea.

Aono, Shigeo, to Nissan Motor Company, Limited. Crankcase blow-by gas recirculating device. 3,673,994, Cl. 123-119.00b.

Appleton Electric Co.: *See—*
Appleton, Norton A.; and Penzel, Herbert W., 3,675,007.

Appleton, Norton A.; and Penzel, Herbert W., to Appleton Electric Co. Explosion proof lighting fixture. 3,675,007, Cl. 240-11.20e.

Arai, Fumiaki: *See—*
Kurokawa, Junji; Arai, Fumiaki; and Usui, Noriyuki, 3,674,474.

Archilithic Co., The: *See—*
Winn, James B., Jr., 3,674,600.

Ardco, Inc.: *See—*
Winsler, Robert J.; and Richter, Frederic A., 3,673,735.

Arden, Thomas Victor; Borra, Albert George; and Clayton, Rolf Crowther, to Permutit Company Limited, The. Process of and apparatus for the ion-exchange treatment of liquids. 3,674,685, Cl. 210-33.000.

Arfert, Horst F. W., to Reynolds Metals Company. Apparatus for and method of operating on container constructions. 3,673,835, Cl. 72-57.000.

Arganbright, Ned H.; Koepnick, Paul J.; Nelson Carl T.; and O'Brien, Arthur F., to Werner Lahara, Inc. Continuous pan conveyor baking apparatus. 3,673,949, Cl. 99-43.000.

Argus Chemical Corporation: *See—*
Brecker, Lawrence R.; and Thee, Alfred, 3,674,737.

Argus Engineering Company, Inc.: *See—*
Costello, Bernard J., 3,674,974.

Arkansas Company, Inc.: *See—*
Sapers, Ira, 3,674,420.

Arlt, Dieter, to Farbenfabriken Bayer Aktiengesellschaft. Chlorosulphonyl vinyl isocyanates and a process for their production. 3,674,829, Cl. 260-453.0al.

Armco Steel Corporation: *See—*
Chalk, David L., 3,674,467.

Armour Industrial Chemical Company: *See—*
Tiefenthal, Harlan E.; Jungermann, Eric; Miller, Eugene J., Jr.; and Callahan, John J., 3,674,879.

Armstrong, James B.; Schott, Dan J.; and Warne, Leland C., to Sperry Rand Corporation. Planar raised cathode alpha-numeric gas discharge indicator. 3,675,066, Cl. 313-109.500.

Arnell, Alvin, to Commercial Envelope Manufacturers, Inc. Sheet feeding device. 3,674,255, Cl. 271-29.000.

Arnold, Richard F.; Dauber, Philip S.; and Sussenguth, Edward H., to International Business Machines Corporation. Pseudo-random code implemented variable block-size storage mapping device and method. 3,675,215, Cl. 340-172.500.

Arnold, William O., Jr., to Union Insulating Company, Inc. Method for attaching bracket means to an imperforate support. 3,673,670, Cl. 29-432.200.

Arrant, Kearney D., to Monsanto Company. Hoisting and transporting device. 3,674,165, Cl. 214-396.000.

Arrigo, Michael F.: *See—*
Asbelle, Charles C.; Arrigo, Michael F.; Hunting, Kenneth E.; and Helmuth, Gene R., 3,673,613.

Artaud, Maurice H.; Johnson, Ronald W.; and Sampath, Prativadi I., to Stromberg Datagraphix, Inc. Microfilm viewer-printer. 3,674,354, Cl. 355-5.000.

Arts, Mathieu Gerardus Henricus; Lucker, Jan Anna Antonius; and Groenenboom, Maarten, to Aluminium Delfzijl N.V. Apparatus for controlling electrode adjustment during aluminum oxide reduction. 3,674,674, Cl. 204-225.000.

Asahi Glass Company Limited: *See—*
Suzuki, Yoshiro; Nagahara, Shigehiro; and Ichimura, Nobuyoshi, 3,674,520.

Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Seko, Maomi; Ogawa, Shinsaku; Komori, Ryozo; Asuma, Masaro; Isoya, Toshiro; and Sakai, Takamasa, 3,674,653.
Senoo, Saburo; Fukuoka, Yohei; and Sasaki, Katuyoshi, 3,674,851.
Shichijo, Yoshihisa; and Tsujihara, Mamoru, 3,674,416.
Takeda, Isao; Iguchi, Takashi; Tsuzuki, Katsuaki; and Nakano, Tooru, 3,674,639.

Asahidenka Kogyo Kabushiki Kaisha: *See—*
Ueda, Tadao; Sato, Kenji; and Nakamura, Yasusi, 3,674,426.

Asato, Goro: *See—*
Berkelhammer, Gerald; Asato, Goro; and Moon, Edward Leslie, 3,674,780.

Asbelle, Charles C.; Arrigo, Michael F.; Hunting, Kenneth E.; and Helmuth, Gene R., to United States of America, Navy. Variable friction knee unit with an improved swing phase control of artificial legs. 3,673,613, Cl. 3-27.000.

Ashe, Anthony Grenfell: *See—*
Howells, Francis Thomas; and Ashe, Anthony Grenfell, 3,674,040.

Ashkin, Arthur; and Ippen, Erich Peter, to Bell Telephone Laboratories, Incorporated. Light wave coupling into thin film light guides. 3,674,335, Cl. 350-96.0wg.

Ashland Oil, Inc.: *See—*
Nordstrom, John David, 3,674,838.

Ashley, James R.; and Palka, Frank M., to Sperry Rand Corporation. Apparatus for measuring frequency modulation noise signals and for calibrating same. 3,675,124, Cl. 324-57.000.

Ashton, Philip E. Hydraulic press. 3,673,800, Cl. 60-54.5ha.

Aspro-Nicholas Limited: *See—*
File, Harold Thomas, 3,674,140.

Associated Engineering Limited: *See—*
Levington, Henry John; and Clark, Charles Keith, 3,673,846.

Astra-Meditec AB: *See—*
Tillander, Hans, 3,674,014.

Asuma, Masaro: *See—*
Seko, Maomi; Ogawa, Shinsaku; Komori, Ryozo; Asuma, Masaro; Isoya, Toshiro; and Sakai, Takamasa, 3,674,653.

Aszalos, Adorjan; Robison, Robert S.; Kraemer, Nancy; Henshaw, Jo Ann; and Giannini, Mary Suzanne, to Squibb, E. R., & Sons, Inc. Tumimycin and process for making same. 3,674,867, Cl. 424-122.000.

Athanas, Terry George, to RCA Corporation. Formation of openings in insulating layers in MOS semiconductor devices. 3,674,551, Cl. 117-212.000.

Atlantic Richfield Company: *See—*
Griesinger, William K.; Sorgenti, Harold A.; and Schell, George W., 3,674,885.
Statton, Gary L.; and Sauer, Richard W., 3,674,715.
Verdol, Joseph A.; and Ryan, Patrick W., 3,674,743.

Atlas Copco Aktiebolag: *See—*
Liedberg, Kurt Herman, 3,674,209.

Atomic Energy of Canada Limited: *See—*
McGregor, John Cameron, 3,674,638.

Atomjuboll S.r.l.: *See—*
Massarotti, Luigi, 3,674,245.

Attia, Edward A.; and Dethlefsen, Rolf, to Allis-Chalmers Manufacturing Company. Vacuum circuit interrupter. 3,674,958, Cl. 200-144.00b.

Audiffred, Sidney J.; Johnson, Lowell E.; and Pearce, Shairyl I., to Caterpillar Tractor Company. Torque converter modulating piston. 3,673,799, Cl. 60-54.000.

Auer, John H., Jr.; and Huffman, Jerry P., to General Signal Corporation. Sonic presence detector system. 3,675,190, Cl. 340-1.000.

Auer, Rupert: *See—*
Becker, Werner; Farwer, Alfward; Frank, Georg; Reis, Bernhard; Rohf, Josef; and Auer, Rupert, 3,674,978.

Aufdermarsh, Carl Albert, Jr.; and Fogiel, Adolf Wojciech, to Du Pont de Nemours, E. I., and Company. Process for preparing flexible polyurethane foams and coatings. 3,674,721, Cl. 260-2.5ac.

Aunstrup, Knud; Andresen, Otto; and Outtrup, Helle, to Novo Terapeutisk Laboratorium A/S. Preparation of proteolytic enzymes having maximum activity at high alkalinity. 3,674,643, Cl. 195-62.000.

Austin, Oliver K.; and Loewen, Bruno F., to Phillips Petroleum Company. Carbon black pellet mixer with sectional helical-pin mixer. 3,674,437, Cl. 23-252.00r.

Automatic Close & Lock Corporation: *See—*
Ratner, George I., 3,674,360.

Automation Industries, Inc.: *See—*
Couture, John W., 3,673,859.

Automobiles Peugeot: *See—*
Froumajou, Armand; and Falay, Bernard, 3,673,882.
Mangin, Jean-Pierre, 3,673,995.
Richard, Gilbert; and Moronval, Gerard, 3,675,033.
Tixier, Michel, 3,673,837.

Avco Corporation: *See—*
Dickey, Thomas A., 3,673,771.
Gregory, David L., 3,675,182.
McGowan, Kenneth J. J., 3,673,963.

Averbach, Alexander U., to Dick, A. B., Company. Reversal electrostatic toner composition. 3,674,693, Cl. 252-62.100.

Averill, Frederick John; and Riley, Norman, to Imperial Chemical Industries Limited. Process for preparing mesidine. 3,674,852, Cl. 260-578.000.

Avisun Corporation: *See—*
Khelghatian, Habet M.; and Poppe, Wassily, 3,674,536.

Awano, Yoji: *See—*
Kimura, Takashi; Majima, Azusa; Hamamoto, Hiroshi; and Awano, Yoji, 3,674,472.

Aydin, Kemal: *See—*
Klockenbrink, Joseph M.; and Aydin, Kemal, 3,675,076.

Ayella, Edmond R., to Penntube Plastics Company. Colored heat shrinkable elastomeric tubing. 3,674,733, Cl. 260-30.600.

Ayres, Richard H.; and Lieder, Gaylerd M., to Bemis Company, Inc. Bag hanger apparatus. 3,673,759, Cl. 53-29.000.

Baba, Jun-Ichi: *See—*
Mitsui, Tsuneo; Baba, Jun-Ichi; and Yamada, Ikuo, 3,675,002.

Babb, Billy W., to Walker, Robert R., Jr. Closet bend stabilizer. 3,674,288, Cl. 285-24.000.

Badachhape, Ramachandra B.: *See—*
Margrave, John L.; Badachhape, Ramachandra B.; Wood, James L.; and Lagow, Richard J., 3,674,432.

Bader, Clifford J.; and Branco, Richard P., to Burroughs Corporation. System for the generation of electrical power having a spring powered prime mover responsive to output voltage. 3,675,113, Cl. 322-28.000.

Badische Anilin- & Soda-Fabrik Aktiengesellschaft: *See—*
Gonon, Eugen, 3,674,387.
Hoffmann, Horst; Krauch, Carl Heinrich; Otto, Hans-Werner; and Volkert, Otto, 3,674,494.
Wuerstlin, Franz; and Feichtmayr, Franz, 3,674,695.

Baginski, Albert R.: *See—*
de Gelder, Jacob; Baginski, Albert R.; and Miller, Anthony D., 3,674,271.

Bagrov, Oleg Nikolaevich: *See—*
Berlin, Zalman Leivikovich; Bagrov, Oleg Nikolaevich; Maslovsky, Gennady Vasilievich; Serkov, Anatoly Gavrilovich; and Yakimovich, Viktor Yakovlevich, 3,673,988.

Bailey, Denis M., to Sterling Drug Inc. 6-Hydroxy-2-azabicyclo [2.2.2]octane-3,6-diones. 3,674,793, Cl. 260-293.540.

Bakelite Xylonite Limited: *See—*
Fletcher, Clive R., 3,673,987.

Bakeman, Orville R.; and French, Allen D., to General Electric Company. Laser oscillator construction. 3,675,153, Cl. 331-94.500.

Baldratti, Giuliana; Consonni, Alberto; and Sciaky, Roberto, to Societa Farmaceutici Italia. Nitro-steroids and process for their preparation. 3,674,817, Cl. 260-397.400.

Baldwin, Roger A.; and Cheng, Ming T., to Kerr-McGee Chemical Corporation, mesne. Phosphorane polyesters and polyamides. 3,674,742, Cl. 260-47.00p.

Baller, Ernst O.; Crandell, Melvin G.; Pease, Donald L.; and Witinski, Francis D., to Xerox Corporation. Sheet feeding apparatus. 3,674,363, Cl. 355-14.000.

Ballu, Vincent Pierre Marie, to Tecnoma. Device for spraying treatment products used particularly for farming. 3,674,208, Cl. 239-77.000.

Bamberg, Paul, to International Standard Electric Corporation. Circuit arrangement for effecting a tuning of a transceiver by means of a magnetic core memory. 3,675,130, Cl. 325-174.000.

Bamberg, Walter H., to Cryogenic Technology, Inc. In-line multistage cryogenic apparatus. 3,673,809, Cl. 62-6.000.

Bancroft Racket Company: *See—*
Hollis, James E., 3,674,267.

Bandyopadhyay, Pratip, to Cities Service Oil Company. Process for reducing heat loss during in situ thermal recovery. 3,674,092, Cl. 166-271.000.

Barber, Joseph J., to Houdaille Industries, Inc. Turret indexing control system. 3,675,107, Cl. 318-601.000.

Barbier, Benard & Turenne. . 7,104,172, Cl. .

Bard, Irving Gary, to Delta Data Systems Corporation. Editing system for video display terminal. 3,675,208, Cl. 340-172.500.

Barden Corporation, The: *See—*
Zeneski, Edmund A., 3,674,356.

Barkan, Philip, to General Electric Company. High voltage electric circuit breaker with rapid response tripping means. 3,674,964, Cl. 200-148.00r.

Barnard, George A., III. Direct charge-rate indicator. 3,673,793, Cl. 58-152.00r.

Barnett, Richard C.; Dark, Joe W.; and Schulze, James L., Sr., said Barnett and Dark assors. to General Electric Company. Gas-fired space heater means. 3,674,005, Cl. 126-91.00a.

Barrer, Richard M.; and Cole, John F., to Air Products and Chemicals, Inc. Aluminosilicates containing soldalite and/or cancrinite cages encapsulating salts. 3,674,709, Cl. 252-454.000.

Barrett, Jack E. J.: *See—*
Mereen, Donald E.; and Barrett, Jack E. J., 3,675,205.

Barrett, Paul Anthony, to Burroughs Wellcome Co. Method of treating or preventing coccidiosis. 3,674,873, Cl. 424-250.000.

Barry, John K , to Southco, Inc. Panel fastener with expandable sleeve. 3,673,913, Cl. 85-70.000.

Barry, Wright, Corporation, mesne: *See—*
Wassell, George W., 3,673,721.

Bartsch, Raymond C.: *See—*
Lerman, Frank; and Bartsch, Raymond C., 3,674,736.

Barusch, Maurice R.: *See—*
Richardson, Wallace L.; Kautsky, George J.; and Barusch, Maurice R., 3,674,826.

Baszczuk, Andrew R.: *See—*
Hameister, Harold L.; and Baszczuk, Andrew R., 3,674,451.

Bata, George L.: *See—*
Hakka, Leo E.; Bata, George L.; and Hazell, John E., 3,674,439.

Bates, John D.; and Olson, Virginia A., to Kimberly-Clark Corporation. Catamental tampon and wrapper therefor. 3,674,029, Cl. 128-285.000.

Batesky, Donald C.: *See—*
Webb, Richard V.; and Batesky, Donald C., 3,674,805.

Bath, Duncan Thomas, to Canadian General Electric Company Limited. Large generator protective relaying scheme. 3,675,080, Cl. 317-13.00r.

Battelle Development Corporation, The: *See—*
Mirick, William M., 3,674,729.

Battelle Development Corporation, The, mesne: *See—*
Johnson, Curtis C., 3,674,008.

Batzer, Hans: *See—*
Lohse, Friedrich; Schmid, Rolf; Fisch, Willy; and Batzer, Hans, 3,674,746.

Bauer, Eddie, to Simco; a co-partnership consisting of and Bauer, Eddie and Bauer, Eddie C. Fishing lure or attractor. 3,673,727, Cl. 43-42.510.

Bauer, Eddie and Bauer, Eddie C.: *See—*
Bauer, Eddie, 3,673,727.

Bauer, Russell E., to KDI-Bauer Corporation. Marine sewage pump. 3,674,380, Cl. 427-92.000.

Baum, Walter Karl-Theodor; and Breitenbach, Otto. Communications cables having reduced interference characteristics. 3,674,933, Cl. 178-68.00b.

Baumann, Bernard, to L'Aluminium Francais. Process for the assembly of sheets and apparatus for same. 3,674,605, Cl. 156-479.000.

Baumann, Dwight M. B. Automatic pattern recognition with weighted area scanning. 3,675,203, Cl. 340-146.3aq.

Baumgartner, Siegfried; Kindler, Hubert; Lidl, Rolf; and Boden, Henrich, 50% to Krauss-Maffei Aktiengesellschaft and 50% to Farbenfabriken Bayer Aktiengesellschaft. Scavenging system for injection-molding machine. 3,674,398, Cl. 425-159.000.

Baumgartner, Siegfried; Fries, Bernd; Lidl, Rolf; and Zippe, Gunter, to Krauss-Maffei Aktiengesellschaft. Molding machine for foam-plastic articles. 3,674,408, Cl. 425-406.000.

Bayless, Robert G.; Shank, Charles P.; Botham Ruth A.; and Werkmeister, Dennis W., to National Cash Register Company, The. Process of forming minute capsules and three-phase capsule-forming system useful in said process. 3,674,704, Cl. 252-316.000.

Bayne, Dennis R.: *See—*
Vahlstrom, Richard E.; Nutten, Donald C.; and Bayne, Dennis R., 3,675,047.

Beals, Robert N. Pressure responsive actuator having application to a valve spool or like device. 3,674,041, Cl. 137-1.000.

Beasley, Donald L., to Townsend Engineering Company. Fatting attachment for skinning machines. 3,674,071, Cl. 146-130.000.

Beatrice Foods Co.: *See—*
Kasik, Robert L.; and Luksas, Anthony J., 3,674,508.

Beatty, David L. Outdoor speaker enclosure. 3,674,108, Cl. 181-31.00b.

Beaver Precision Products, Inc.: *See—*
Doran, Leo F.; and Schlenker, Theodore R., 3,673,817.

Bechtel International Corporation: *See—*
Ellers, Frederick S.; Small, Sam W.; and Serpas, Luis B., 3,674,062.

Becker, Charles H.: *See—*
Brimmer, Donald B.; Brown, James Stuart; and Becker, Charles H., 3,674,686.

Becker, Norman D. Method and apparatus for drilling and casing a large diameter borehole. 3,674,100, Cl. 175-69.000.

Becker, Werner: *See—*
Schrotz, Kurt; and Becker, Werner, 3,674,609.

Becker, Werner; Farwer, Alfward; Frank, Georg; Reis, Bernhard; Rohf, Josef; and Auer, Rupert, to Messer Griesheim G.m.b.H. Torch, especially for plasma cutting. 3,674,978, Cl. 219-121.00p.

Beckham, Robert R.; Walters, Emmett L.; Brown, Jack G.; De Rose, Kenneth M.; and Ryan, Joseph D., to Libbey-Owens-Ford Company. Filming apparatus. 3,673,981, Cl. 118-6.

Beckman Instruments, Inc.: *See—*
Gomez, Ray J.; and Sawa, Kenneth B., 3,674,153.

Becton, Dickinson & Company: *See—*
Beury, James Prescott, III; and Burridge, Robert Ernest, 3,673,868.

Beddows, Norman A.; Quigley, John A.; and Wielt, Warren P., to General Electric Company. Dynamoelectric machine utilizing preformed winding connectors and method of making. 3,675,058, Cl. 310-71.000.

Bedker, Bruce D.; and Wunderlich, Frederich C., to Salvo Tool & Engineering Company. Centering attachment. 3,673,832, Cl. 72-35.000.

Bedocs, Michael F., to Cherry Electrical Products Corporation. Panel-mounted switch. 3,674,970, Cl. 200-168.00c.

Beecham Group Limited: *See—*
Long, Anthony Alfred Walter; and Nayler, John Herbert Charles, 3,674,776.

Beidil, Max: *See—*
Nielsen, Ole; and Beidil, Max, 3,673,839.

Belhomme, Charles: *See—*
Yperman, Jean Michel Baudry Ghislain; and Belhomme, Charles, 3,674,713.

Bell & Howell Company: *See—*
Betlejewski, Frank W.; and Hanberg, Sanford M., 3,674,948.
Carlson, Richard K., 3,673,934.
Figge, Erwin E.; and Ho, Edward J., 3,674,348.
Iha, Kiyoshi, 3,674,347.
Lancor, Joseph H., Jr., 3,674,346.

Bell, Anthony Geoffrey. High speed dynamic buffer. 3,675,043, Cl. 307-205.000.

Bell Canada: *See—*
Leyburn, Derek; Montague, Bernard R.; and Mattila, Henry K., 3,674,940.

Bell, Jack T.; and Smith, Barton K., to Weyerhaeuser Company. Bottom flap folding and conveying apparatus. 3,673,764, Cl. 53-374.000.

Bell, Randall P.: *See—*
Lazar, Burton A.; Bell, Randall P.; and Vanderhoef, John P., 3,673,723.

Bell, Randall P.; and Vanderhoef, John P., to Intercraft Industries Corporation. Interconnecting picutre frames. 3,673,724, Cl. 40-152.000.

Bell Telephone Laboratories, Incorporated: *See—*
Anderson, Robert V.; and Hagelbarger, David W., 3,675,240.
Ashkin, Arthur; and Ippen, Erich Peter, 3,674,335.
Beurrier, Henry Richard, 3,675,145.
Boyd, Gary Delane; Buehler, Ernest; and Gandrud, William Bentley, 3,675,039.
Danielmeyer, Hans Guenter, 3,675,156.
Duguay, Michel Albert; and Hansen, John Wilfred, 3,675,154.
Erdman, William Charles, 3,674,580.
Feldman, Martin; and Heiter, George Ludwig, 3,675,025.
Goldrick, Michael Richard; Kerwin, Robert Eugene; and Skinner, John George, 3,674,492.
Griffiths, James Edward, 3,674,696.
Hamilton, Billy Harold, 3,675,037.
Judd, Frank Fuller; and Wilhart, Helmut, 3,675,158.
Judd, Frank Fuller; Lieberman, Jan Mark; and Wilhart, Helmut, 3,675,159.
Kaminow, Ivan Paul; and Weber, Heinz Paul, 3,675,157.
Kogelnik, Herwig Werner, 3,674,332.
Kogelnik, Herwig Werner, 3,674,336.
Lawrence, Thomas Russell, 3,674,935.
Marcatili, Enrique Alfredo Jose, 3,674,337.
McKiernan, Dennis Lester, 3,675,127.
O'Brien, Kevin Christopher, 3,675,136.
Rushton, John R., 3,674,498.
Seidel, Harold, 3,675,164.
Shoap, Stephen Davis, 3,675,236.
Weller, David Reis, 3,675,135.
Yenisey, Osman Metin, 3,675,048.

Bellanger, Maurice Georges; Daguet, Jacques Lucien; and Duong, Tuan Kiet, to S.A. Telecommunications Radioelectriques et Telephoniques T.R.T. Transmission device for the transmission of analog signals by means of pulse code modulation. 3,674,937, Cl. 179-15.

Bellis, Harold Edward, to Du Pont de Nemours, E. I., and Company. Nickel or cobalt wear-resistant compositions and coatings. 3,674,447, Cl. 29-196.600.

Bemberg S.p.A.: *See—*
Cerutti, Giacomo, 3,673,650.

Bemis Company, Inc.: *See—*
Ayres, Richard H.; and Lieder, Gaylerd M., 3,673,759.

Benard, Christian Louis Georges, to Societe Parisienne des Anciens Etablissements Barbier, Benard & Turenne. Photo-electric positioning device. 3,675,024, Cl. 250-208.000.

Bencsics, Odon Steven; and Von Beckmann, Helmut Rolf Erich. Light reference system for railroad track surveying. 3,675,233, Cl. 340-258.00b.

Bendix Corporation, The: *See—*
Chilton, Charles B., 3,675,126.
Giardini, Dante S., 3,673,739.
Giardini, Dante S.; and Szempruch, Robert S., 3,673,740.
Giardini, Dante S.; and Wieg, Heinrich J., 3,673,743.
Hickner, George B.; Howard, Donald W.; and Suttle, Ward C., 3,674,318.
Howard, Donald W., 3,674,114.
Howard, Donald W.; and Hickner, George B., 3,674,320.
Kasselmann, John T., 3,673,875.
Mayer, Endre A., 3,674,044.

Millman, William V.; and Mayer, Endre A., 3,674,045.
Teitelbaum, Bernard R., 3,673,857.
Tirabassi, Benjamin John, 3,674,251.

Benedict, Neil W., Jr., to Ajax Tool Works, Inc. Lead sleeve cutting tool. 3,673,686, Cl. 30-168.000.

Benjamin, Thaer L.; and Reynolds, Carole A. Basket game utilizing convexly shaped paddles and an irregularly shaped ball. 3,674,270, Cl. 273-101.000.

Bennett, Donald L. Tools for applying self-adhesive surface covering material. 3,674,610, Cl. 156-579.000.

Bennett, Fay M.: *See*—
Phillips, Cecil E.; and Bennett, Fay M., 3,673,687.

Bennett, Ronald W.; Parker, Donald L.; and Shaw, Arthur R., to General Motors Corporation. Brake lining wear sensing circuit. 3,675,197, Cl. 340-52.00a.

Bennett, Roswell J., to Union Carbide Corporation. Oxygen-depolarized galvanic cell. 3,674,563, Cl. 136-86.00a.

Benson, Victor Mark: *See*—
Molloy, Kenneth H.; Ward, John P.; and Benson, Victor Mark, 3,675,196.

Benson, William G., to Litton Business Systems, Inc. Handheld magnetic transducer with tip members having a hemisperical reading portion. 3,674,943, Cl. 179-100.20c.

Benz, Hanspeter, to Varian Associates. Method and apparatus for automatic phase control in a fourier analyzed readout of impulse resonance data. 3,674,998, Cl. 235-151.300.

Benz, Helmut: *See*—
Neuhauser, Hans; Benz, Helmut; and Gukelberger, Werner, 3,673,919.

Benzing, Robert J.: *See*—
Clow, William L.; Benzing, Robert J.; and McConnell, Bobby D., 3,674,690.

Berg, David A., to Allis-Chalmers Manufacturing Company. Bulldozer blade mounting. 3,674,096, Cl. 172-805.000.

Berger, Erwin: *See*—
Gruenig, Rudolf; Berger, Erwin; and Sieber, Charles, 3,674,200.

Bergum, Bernard C.; and Kenyon, Kenneth H., to ESB Incorporated. Multicell battery having double adhesive, liquid sealing window. 3,674,565, Cl. 136-111.000.

Berkelhammer, Gerald; Asato, Goro; and Moon, Edward Leslie, to American Cyanamid Company. Novel 2,5-disubstituted thiazole carboxaldehyde and derivatives of the same. 3,674,780, Cl. 260-240.00g.

Berkovits, Barouh V., to American Optical Corporation. Rate discriminatory electrocardio-graphic monitoring system. 3,674,015, Cl. 128-2.06f.

Berlin, Zalman Leivikovich; Bagrov, Oleg Nikolaevich; Maslovsky, Gennady Vasilievich; Serkov, Anatoly Gavrilovich; and Yakimovich, Viktor Yakovlevich, to Gosudarstvenny Naucho-issledovatelsky Institut tsvetnykh metallov and Belgorodsky Kotlo-Stroitelny zavod. Exhaust heat boiler. 3,673,988, Cl. 122-7.00r.

Bernard, Georges: *See*—
Labbaye, Louis; and Bernard, Georges, 3,675,079.

Bernard, Piq. Plate carrying a plurality of inscriptions. 3,673,718, Cl. 40-5.000.

Berney, Jean Claude, to Compagnie des Montres Longines. Circuit for regulating the mean frequency of an oscillating system. 3,675,147, Cl. 331-8.000.

Bertram, Leroy W., to Unarco Industries, Inc. Pneumatic safety system for vehice lading. 3,673,968, Cl. 105-369.0ba.

Bethlehem Steel Corporation: *See*—
Booth, Robert C., 3,675,118.

Betlejewski, Frank W.; and Hanberg, Sanford M., to Bell & Howell Company. Control mechanism having cycle switches selectively actuating a mode switch. 3,674,948, Cl. 200-50.00c.

Betz, Norman L.; and Stepaniuk, Nickolas J., to Mallinckrodt Chemical Works. Preparation of soybean derivatives useful as egg white extenders and whipping agents. 3,674,501, Cl. 99-17.000.

Beurrier, Henry Richard, to Bell Telephone Laboratories, Incorporated. Amplifier with matched input and output. 3,675,145, Cl. 330-124.00r.

Beury, James Prescott, III; and Burridge, Robert Ernest, to Becton, Dickinson & Company. Temperature probe. 3,673,868, Cl. 73-343.00r.

Beutel, Rolf Ernst; and Raaf, Helmut Wilhelm, to Pfizer Inc. Aqueous doxycycline compositions. 3,674,859, Cl. 424-80.000.

Bevens, Darwin K. Multisensory teaching apparatus. 3,673,708, Cl. 35-37.000.

Bexford Limited: *See*—
Shephard, Robert Basil; Clachan, Margaret Loudon; Kennedy, David Rankine; and Abbott, Terence Arnold, 3,674,531.

Bezrodny, Marlen Solomonovich. Automatic device for making drawings. 3,675,231, Cl. 340-324.

Bice, John R.; and Lewis, Philip J., to Brogdex Company. Method and composition for preventing decay of fruit and inhibiting sporulation thereon. 3,674,510, Cl. 99-154.000.

Biddison, John M., to Globe Tool and Engineering Company, The. Shaft rotating mechanism. 3,673,878, Cl. 74-125.500.

Bielefeldt, Irvin P.: *See*—
Moreau, Glenn T.; and Bielefeldt, Irvin P., 3,673,678.

Bier, Albert, to Moeller & Neumann GmbH. Screwdown devices for rolling mills. 3,673,841, Cl. 72-248.000.

Billiet, Jan Maria G. R. Process and machine according to this process for printing or dyeing textiles or sheet material. 3,673,958, Cl. 101-122.000.

Billino, Rene Alfredo. Safety lock. 3,673,830, Cl. 70-352.000.

Bintzer, William W., to Lukens Steel Company. Method and apparatus for reducing air infiltration into electric arc furnace during the charging and melting operation. 3,674,903, Cl. 13-9.000.

Bio-Medical Sciences, Inc.: *See*—
Sagi, Zsigmond, 3,674,176.

Birnkrant, Melvin, to Colorforms. Percussion musical instrument. 3,673,909, Cl. 84-403.000.

Birtchet, Ralph D., to Schneider-Simpson, Inc. Screed extension assembly for asphalt paving machines. 3,673,930, Cl. 94-45.00r.

Bitko, Sheldon S., to Fifth Dimension Inc. Welding head for producing uniform and repeatable resistance welds. 3,674,976, Cl. 219-86.000.

Bjornson, Geir; and Fox, Homer M., to Philips Petroleum Company. Electric arc process for making hydrogen cyanide, acetylene and acrylonitrile. 3,674,668, Cl. 204-171.000.

Black and Decker Manufacturing Company, The: *See*—
Fritts, Russell A.; and Nebold, Jerome I., 3,673,921.
Weber, Edwin J., 3,673,777.

Blair, Richard L. Treating liquid waste effluent. 3,674,216, Cl. 241-18.000.

Blaisdell, William H.; and Cornelius, Edward C., to Eastman Kodak Company. Flying spot scanning. 3,675,016, Cl. 250-83.30h.

Blanchette, Robert G., to Addressograph-Multigraph Corporation. Cumulene containing photoconductive binder elements for use in electrophotography. 3,674,473, Cl. 96-1.500.

Blank, Fritz; Day, William C.; Harmon, Sandra R.; Toncic, Pauline F.; and Yu, Ruey J., to Temple University. Keratinolytic enzyme isolated from trichophyton mentagorphytes and process therefor. 3,674,645, Cl. 195-66.00r.

Blatter, Herbert Morton: *See*—
Mizzoni, Renat Herbert; and Blatter, Herbert Morton, 3,674,794.

Blaw-Knox Foundry & Mill Machinery, Inc.: *See*—
Robinson, Raymond E., 3,674,193.

Bleh, Otto: *See*—
Dijkhuizen, Willem; Termin, Erich; Bleh, Otto; and Morgenstern, Dieter, 3,674,716.

Bleuer, Keith T. Tampon assembly. 3,674,025, Cl. 128-263.000.

Bljumberg, Erna Albertovna; Bobolev, Alexandr Vasilievich; Boboleva, Svetlana Pavlovna; and Emanuel, Nikolai Markovich. Method of producing propylene oxide, propyleneglycol and its esters. 3,674,813, Cl. 260-348.5.

Block, Donald Edmund; and Alexakis, Nicholas George, to Digital Data Systems, Inc., mesne. Method and apparatus for the transmission of acquired data in the form of magnitude representing signals and signals representing changes of scale of magnitude. 3,675,210, Cl. 340-172.500.

Bloomer-Fiske, Inc.: *See*—
Neubeck, William H., Jr., 3,674,163.

Blose, James H.; and Talvalkar, Shashikant G., to National Cash Register Company, The. Heat sensitive record material. 3,674,535, Cl. 117-36.800.

Bluhm, Herbert J.; and Fluck, Eugene R., to Reynolds, R. J., Tobacco Company. 1,3,3,4,4-pentasubstituted pyrrolidines. 3,674,806, Cl. 260-326.8.

Blumber, Hans: *See*—
Wahlen, Werner; and Blumber, Hans, 3,673,920.

Boardman, Charles Robert: *See*—
Knutson, Carroll F.; and Boardman, Charles Robert, 3,674,313.

Boassy, Emil J.; and Shanni, Vincent, to Champion Incorporated. Building and swimming pool construction. 3,673,751, Cl. 52-169.000.

Bobolev, Alexandr Vasilievich: *See*—
Bljumberg, Erna Albertovna; Bobolev, Alexandr Vasilievich; Boboleva, Svetlana Pavlovna; and Emanuel, Nikolai Markovich, 3,674,813.

Boboleva, Svetlana Pavlovna: *See*—
Bljumberg, Erna Albertovna; Bobolev, Alexandr Vasilievich; Boboleva, Svetlana Pavlovna; and Emanuel, Nikolai Markovich, 3,674,813.

Bock, Burkhard: *See*—
Schmalfeld, Paul; Janssen, Heinrich; Bock, Burkhard; Peters, Werner; and Ahland, Erwin, 3,674,449.

Bock, Herbert G.; and Szerejko, Walter J., to Chandler Evans, Inc. Apparatus for filling a pressure vessel. 3,673,762, Cl. 53-86.000.

Bock, Robert V.: *See*—
Trost, Joseph C.; Bock, Robert V.; Gerbstadt, Frederick H.; Graham, William J.; Miles, Wilson D.; and Questa, Charles R., 3,675,209.

Boden, Henrich: *See*—
Baumgartner, Siegfried; Kindler, Hubert; Lidl, Rolf; and Boden, Henrich, 3,674,398.

Boehmke, Gunther, to Farbenfabriken Bayer Aktiengesellschaft. Process for the production of glycol esters of carboxylic acids. 3,674,835, Cl. 260-473.00r.

Boercker, Ethel. Matching game apparatus. 3,674,264, Cl. 273-1.00r.

Bohm, Horst Otto: *See*—
Laue, Hans-Jurgen Rainer; Bohm, Horst Otto; and Reddemann, Bernhard Hermann, 3,674,470.

Boissier, Jacques Robert; and Ratouis, Roger, to Societe Anonyme dite: Roussel-UCLAF. 10,11-Dihydro-,9,10-dihydro-10,10-dimethyl-5- or 9-[3-amino-2-oxo- or-hydroxy-propylidene]-5H-dibenzo [a,d] cycloheptenes and -anthracenes. 3,674,841, Cl. 260-501.120.

Bokov, Jury Sergeevich; Vikulina, Ninel Vladimirovna; Dogadkin, Boris Aristarkhovich; Erofeev, Boris Vasilievich; Larina, Anastasia Vasilievna; Lavrischev, Vadim Petrovich; Markov, Vladimir Vladimirovich; Naumova, Sofia Fadeevna; Jurina, Olge Demidovna; and Yarovaya, Galina Dmitrievne. Negative light-sensitive material. 3,674,496, Cl. 96-91.00n.

Bokvist, Kjell; and Ingestrom, Curt Holger, to Aktiebolaget Svenska Icopalfabriken, mesne. Bottom for buildings without basement, and a method of making such bottom. 3,673,750, Cl. 52-169.000.

Boliden Aktiebolag: *See*—
Gorling, Karl Goran, 3,674,462.

Bombardier Limited: *See*—
Southiere, Bertrand, 3,673,884.

Bommer, Peter; and Menzi, Hans, to Mettler Instruments AG. Platform balance. 3,674,102, Cl. 177-256.000.

Bondina Limited: *See*—
Pearson, William Michael; and Pearson, Anthony, 3,674,593.

Bonnette, Richard Arthur, to RCA Corporation. Filamentary display devices. 3,673,652, Cl. 29-25.160.

Bookwrights, Inc.: *See*—
Sendor, Mortimer S., 3,674,399.

Booth, Robert C., to Bethlehem Steel Corporation. Multi-probe method and apparatus for detecting, correlating and classifying defects in test members. 3,675,118, Cl. 324-37.000.

Booth, Robert W.: *See*—
Sheets, Harry L.; and Booth, Robert W., 3,674,265.

Boothe Airside Systems, Inc., mesne: *See*—
Eggert, Walter S., Jr., 3,673,675.
Santos, Gerard R.; and Herring, James M., Jr., 3,674,107.

Bore, Pierre, to Societe Anonyme dite: L'Oreal. Treatment of human hair with zinc and cadmium dithiolate derivatives. 3,674,038, Cl. 132-7.000.

Borg-Warner Corporation, mesne: *See*—
Iliopulos, Miltiadis I.; and Hindersinn, Raymond R., 3,674,748.

Borkovsky, Gennady Mikhailovich; Tsukernik, Vitaly Borisovich; and Ierusalimskaya, Irina Nikolaevna. Seismic prospecting station. 3,675,194, Cl. 340-15.5dp.

Bormann, Gerhard; Gmunder, John; Wilkens, Heinrich; and Troxler, Franz, to Sandoz Ltd.; a/k/a and Sandoz A.G. 1,2,2a,3,4,5-Hexanhydro-1-(2-imidazolin-2-ylamino)-benz [cd] indoles. 3,674,801, Cl. 260-309.600.

Borra, Albert George: *See*—
Arden, Thomas Victor; Borra, Albert George; and Clayton, Rolf Crowther, 3,674,685.

Bossen, Douglas C.; Henle, Robert A.; Hsiao, Mu Y.; Maley, Gerald A.; and Pricer, W. David, to International Business Machines Corporation. System for expanded detection and correction of errors in parallel binary data produced by data tracks. 3,675,200, Cl. 340-146.10f.

Botham Ruth A.: *See*—
Bayless, Robert G.; Shank, Charles P.; Botham Ruth A.; and Werkmeister, Dennis W., 3,674,704.

Botney, Richard H. Compact folding chair. 3,674,306, Cl. 297-17.000.

Bowerman, William R. Compensated phonograph turntable. 3,674,278, Cl. 274-39.00a.

Bowman, P. H., Company, Inc.: *See*—
Petersen, George R., 3,673,671.

Box, E. O., Jr.; Drehman, Lewis E.; and Farha, Floyd E., Jr., to Phillips Petroleum Company. Tin impregnation regeneration of group VIII reforming-dehydrogenation catalysts. 3,674,706, Cl. 252-412.000.

Boyd, Gary Delane; Buehler, Ernest; and Gandrud, William Bentley, to Bell Telephone Laboratories, Incorporated. Coherent optical devices employing zinc germanium phosphide. 3,675,039, Cl. 307-88.300.

Boyd, Sherman H., Jr., to Stromberg Datagraphix, Inc. Surface deformation imaging process. 3,674,591, Cl. 156-272.000.

Boynton, James S.: *See*—
Reed, Everett E.; and Boynton, James S., 3,674,375.

Bradley, Thompson G.; and Swinkels, Dominicus A. J., to General Motors Corporation. Electrolysis cell and process using a wick electrode. 3,674,567, Cl. 136-164.000.

Brady, Donnie G., to Phillips Petroleum Company. Quarternary phosphonium salt catalyzed synthesis of urethanes and polyurethanes. 3,674,750, Cl. 260-77.50r.

Branco, Richard P.: *See*—
Bader, Clifford J.; and Branco, Richard P., 3,675,113.

Brandl, Willi. Central heating and service water system. 3,674,204, Cl. 237-8.000.

Brandstrom, Arne Elof; Carlsson, Per Arvid Emil; Carlsson, Stig Ake Ingemar; Corrodi, Hans Rudolf; Ek, Lars; Lamm, Bo Robert; and Ablad, Bengt Arne, to Aktiebolaget Hassle. 1-(Para-alkoxyalkoxyphenyl)-2-hydroxy-3-alkylaminopropanes and the salts thereof. 3,674,840, Cl. 260-501.170.

Brants, Johannes Petrus; and Van der Meulen, Johan, to Akzo N.V. Masonry materials that resist efflorescence and are colored with increased intensity and permanence, and methods of producing such materials. 3,674,522, Cl. 106-90.000.

Brasty, Joseph. Theft-proof automobile ignition system. 3,675,035, Cl. 307-10.0at.

Bratko, Rudolph S. Process for coating wire. 3,674,537, Cl. 117-49.000.

Braun Aktiengesellschaft: *See*—
Fischer, Richard, 3,673,683.

Braun, Anton: *See*—
Lacy, James G.; and Byrne, John V., 3,673,999.

Braunhut, Harold N. Method and materials used for hatching brine shrimp. 3,673,986, Cl. 119-2.000.

Braxton, James Lopez, Jr.: *See*—
Francini, Joseph Pirra; Braxton, James Lopez, Jr.; Lewis, Vera Gloria; McPherson, Frank Henderson; Rosenberg, Daniel; and Sekse, Torkjell, 3,674,988.

Breckenridge, George J.: *See*—
Kalnin, Ilmar L.; and Breckenridge, George J., 3,674,581.

Brecker, Lawrence R.; and Thee, Alfred, to Argus Chemical Corporation. Reaction products of dialkyltin oxides and higher dialkyltin monohydric aliphatic saturated alcohol esters of thiomalic and thiolactic acids. 3,674,737, Cl. 260-45.75k.

Breitenbach, Karl-Heinz, to SKF Kugellagerfabriken GmbH. Apparatus for spinning yarn. 3,673,781, Cl. 57-58.890.

Breitenbach, Otto: *See*—
Baum, Walter Karl-Theodor; and Breitenbach, Otto, 3,674,933.

Brenda Mines, Ltd.: *See*—
Stanley, Robert W.; Ames, Horace L.; and Jennings, Peter H., 3,674,424.

Brendel, Gottfried J., to Ethyl Corporation. Synthesis of substituted 7-octen-1-ols. 3,674,846, Cl. 260-632.00r.

Brevick, Arnold A., to UID Electronics Corporation. Slide switch with snap action. 3,674,953, Cl. 200-77.000.

Bridge, Alan G.: *See*—
Mitchell, David S.; Bridge, Alan G.; and Scott, John W., 3,674,682.

Brimmer, Donald B.; Brown, James Stuart; and Becker, Charles H., to DeLaval Turbine, Inc. Filter precoating method. 3,674,686, Cl. 210-37.000.

Brinckman, Eric Maria: *See*—
Vrancken, Marcel Nicolas; Brinckman, Eric Maria; and Heugebaert, Frans Clement, 3,674,483.

Bristol, Thomas R.; Lakin, Harold; and Renga, Fred L., to Kleer-Vu Industries, Inc. Collating and collecting apparatus. 3,674,142, Cl. 209-74.000.

Britax London Limited: *See*—
Burleigh, David William, 3,673,645.

British Iron and Steel Research Association, The: *See*—
Sturgeon, George; and Jackson, George, 3,674,389.
Sturgeon, George Mc Hardy; and Sheffield, Jackson George, 3,674,390.

British Petroleum Company Limited, The: *See*—
Desty, Denis Henry; and Whyman, Barry Herbert Francis, 3,674,409.

British Steel Piling Company Limited, The: *See*—
Virgo, James Russell, 3,674,098.

Brogdex Company: *See*—
Bice, John R.; and Lewis, Philip J., 3,674,510.

Bronson, George E., to N. L. Industries, Inc., mesne. Titanium dioxide pigment compositions of matter useful in printing ink compositions. 3,674,528, Cl. 106-300.000.

Bronzine, Bruno, to Fratelli Morando & C. S.p.A. Horizontal lathe with overhead bridge. 3,673,898, Cl. 82-2.500.

Brookhyser, Byron B., to Weyerhaeuser Company. Thin sheet thrower. 3,674,256, Cl. 271-63.000.

Brooks, Fred A. Baseband pulse code modulation system. 3,674,939, Cl. 179-15.55r.

Brooks, Martin Frederick; and Kerrigan, Vincent, to Imperial Chemical Industries Limited. Preparation of liquid diphenylmethane diisocyanate compositions. 3,674,828, Cl. 260-453.00p.

Brown, Anthony R., to Racal-Mobilcal Limited. Electrical transformers. 3,675,176, Cl. 336-182.000.

Brown, Boveri & Cie: *See*—
Zimmermann, Volker, 3,674,994.

Brown, Boveri & Cie Aktiengesellschaft: *See*—
Korner, Gerhard; Schmitz, Wolfgang; Dabringhausen, Friedhelm; and Gruber, Lothar, 3,674,957.

Brown Boveri & Company Limited: *See*—
Iten, Paul Dominik; and Mottier, Francois, 3,675,029.

Brown, Dwight C. Bag closure. 3,673,640, Cl. 24-30.50r.

Brown, Jack G.: *See*—
Beckham, Robert R.; Walters, Emmett L.; Brown, Jack G.; De Rose, Kenneth M.; and Ryan, Joseph D., 3,673,981.

Brown, James Stuart: *See*—
Brimmer, Donald B.; Brown, James Stuart; and Becker, Charles H., 3,674,686.

Brown, Lowell N. Air nozzles. 3,674,214, Cl. 239-526.000.

Brown, Melvin Henry, to Aluminum Company of America. Method of water purification. 3,674,652, Cl. 203-11.000.

Brown, Robert A., Jr.: *See*—
Jeffery, Robert W.; Brown, Robert A., Jr.; and Cullen, Allen F., 3,673,978.

Brown, Robert H.; Anderson, William A.; and King, William, to Aluminum Company of America. Anodic aluminum material and articles and composite articles comprising the material. 3,674,448, Cl. 29-197.500.

Brown, Thomas W. Rail and brace end coupling. 3,674,243, Cl. 256-65.000.

Brownbuilt Limited: *See*—
Clempson, Philip George, 3,673,838.

Bruckner-Apparatebau Michelstadt GmbH: *See*—
Schuierer, Manfred, 3,673,825.

Brugger, Franz; and Paul, Jurgen, to Daimler-Benz Aktiengesellschaft. Safety circuit for a brake-force control installation intended for vehicles especially for motor vehicles. 3,674,319, Cl. 303-21.0cg.

Brun, Henri, to CSF-Compagnie Generale de Telegraphite Sans Fil. Optical resonance cell with means for regulating internal vapor pressure. 3,675,067, Cl. 313-174.000.

Brunner, Hans A.; and Vogeleer, George B., to Reynolds Metals Company. Apparatus for and method of operating on container constructions. 3,673,834, Cl. 72-57.000.

Bubblitz, Donald E., to Dow Chemical Company, The. Tricyclohexyltin esters. 3,674,789, Cl. 260-270.000.

Buckwalter, Paul S.: *See*—
Street, Frederick G.; and Buckwalter, Paul S., 3,674,276.

Budzak, Steve, to Marvin Shafer Co., Inc. Pusher accessory for roll forming machine. 3,674,259, Cl. 271-84.000.

Buehler, Ernest: *See*—
Boyd, Gary Delane; Buehler, Ernest; and Gandrud, William Bentley, 3,675,039.

Buffington, James F. Grain drying apparatus. 3,673,699, Cl. 34-66.000.

Bugaut, Andree: *See*—
Kalopissis, Gregoire; Gascon, Jean; Gallien, Jacqueline; Bugaut, Andree; and Gaston-Breton, Hubert, 3,674,414.

Buhmann, Walter, Dipl. Ing., Elektro-Apparate-Bau GmbH: *See*—
Schlickeiser, Klaus, 3,675,207.

Buhr Machine Tool Corporation, mesne: *See*—
Gerchow, Wilbur R., 3,673,656.

Buisker, Raymond A., to Warner Electric Brake & Clutch Company. Magnetic friction clutch-brake unit. 3,674,122, Cl. 192-113.00a.

Burbick, Ross E.: *See*—
Calisher, Jay V.; and Burbick, Ross E., 3,674,061.

Burchill, Phyllis I.: *See*—
Schilling, Eugene D.; and Burchill, Phyllis I., 3,674,506.

Burke, John W. Variable speed tractive transmission. 3,673,881, Cl. 74-198.000.

Burkholder, Jack: *See*—
Porter, Donald E.; and Burkholder, Jack, 3,674,235.

Burleigh, David William, to Britax London Limited. Safety belt anchorage. 3,673,645, Cl. 24-23.000.

Burlis, Norbert W.; and Talonn, Daniel A., to Sherwood Medical Industries Inc. Extruder apparatus and accumulator. 3,674,404, Cl. 425-326.000.

Burr, Robert Page, to Photocircuits Corporation. Wire scribed circuit boards and method of manufacture. 3,674,914, Cl. 174-68.500.

Burridge, Robert Ernest: *See*—
Beury, James Prescott, III; and Burridge, Robert Ernest, 3,673,868.

Burroughs Corporation: *See*—
Bader, Clifford J.; and Branco, Richard P., 3,675,113.
Hunter, James R.; Lazzarotti, Sebastion James; and Mann, Abe, 3,674,143.
McKissick, John A.; and McGregor, Arvin D., 3,675,201.
Trost, Joseph C.; Bock, Robert V.; Gerbstadt, Frederick H.; Graham, William J.; Miles, Wilson D.; and Questa, Charles R., 3,675,209.
Wolfe, Fred G., 3,674,936.

Burroughs Wellcome Co.: *See*—
Barrett, Paul Anthony, 3,674,873.

Burrus, Bill S., to Combustion Engineering, Inc. Liquid level detector. 3,673,850, Cl. 73-1.00r.

Bush, Harold Jesse, to Thomas & Betts Corporation. Stripping apparatus. 3,673,894, Cl. 81-9.510.

Busi, Ettore. Device for applying liners of thermoplastic material to closure caps or the like. 3,674,393, Cl. 425-110.000.

Butler Manufacturing Company: *See*—
McCarthy, Robert P.; and Matlock, Charles W., 3,674,620.

Butscher, Karlheinz, to Carl Zeiss-Stiftung; d/b/a and Zeiss, Carl. Interpolation means for displacement measurement. 3,675,238, Cl. 340-347.0sy.

Butt, John B.: *See*—
Foster, Richard N.; and Butt, John B., 3,674,666.

Buzalski, Bruce T.: *See*—
Gulbrasen, Earl A.; Tallman, Richard L.; Andrew, Kenneth F.; and Buzalski, Bruce T., 3,675,004.

Buzzolini, Mario G., to Sandoz-Wander, Inc. 1-p-(ω-aminoalkyl) phenyl-cyclohexanes, cyclohexenes and cyclohexanols. 3,674,807, Cl. 260-326.50m.

Byrne, John V.: *See*—
Lacy, James G.; and Byrne, John V., 3,673,999.

Cadwell, Gilbert C., to Rohr Corporation. Shock wave riveting means and method. 3,673,833, Cl. 72-56.000.

Cain, Charles L.: *See*—
Clingenpeel, William R.; Cain, Charles L.; Hungerford, Philip C., Jr.; and Hayes, Robert R., 3,674,085.

Cain, James P.; and Cross, John H., to Deering Milliken Research Corporation. Molded hats having improved shape retention and recoverability. 3,673,611, Cl. 2-192.000.

California Computer Products, Inc.: *See*—
Tanaka, Edward Y.; Cossaart, Darrel D.; and Edwards, Norman B., 3,673,680.

Calisher, Jay V.; and Burbick, Ross E., to Wiggins, E. B., Inc. Liquid transfer apparatus with pressure-sensitive automatic shut-off nozzle. 3,674,061, Cl. 141-198.000.

Callahan, Jack D. Copy camera. 3,674,366, Cl. 355-55.000.

Callahan, John J.: *See*—
Tiefenthal, Harlan E.; Jungermann, Eric; Miller, Eugene J., Jr.; and Callahan, John J., 3,674,879.

Callan, John E., to Cities Service Company. Semi-vulcanized butyl rubber for sealant applications. 3,674,735, Cl. 260-33.6aq.

Cameli, Nazzareno; Longi, Paolo; and Valvassori, Alberto, to Goodrich, B. F., Company, The. Vulcanizable ethylene/propylene copolymers and process for their preparation. 3,674,754, Cl. 260-79.50.

Canadian General Electric Company Limited: *See*—
Bath, Duncan Thomas, 3,675,080.

Canadian Patents and Development Limited: *See*—
Farnand, Joseph Redmond; and Puddington, Ira Edwin, 3,674,461.

Canamero, Ernest V.; and Ullmann, Christoph, to American Can Company. Packaging method and apparatus. 3,673,760, Cl. 53-22.00a.

Canon Kabushiki Kaisha: *See*—
Hasegawa, Goro; and Ito, Masaharu, 3,674,343.
Sayanagi, Kazuo, 3,674,339.

Canon Kabushiki Kaisha, mesne: *See*—
Knechtel, Wilhelm Josef; and Schaffer, Detlef, 3,675,010.

Cape, Arthur T., to Coast Metals, Inc. Method of arc welding. 3,674,979, Cl. 219-137.000.

Caperton, Charles B. Drive for rodding machine. 3,673,627, Cl. 15-104.3sn.

Caprarola, Leroy J., to RCA Corporation. Hybrid thermoelectric generator. 3,674,568, Cl. 136-205.000.

Carasso, Daniel, to Societe anonyme dite: Compagnie Gervais-Danone. Volume-inflated freezable product preservable in the fresh state and a process for manufacturing same. 3,674,507, Cl. 99-136.000.

Carbajal, Bernard G., III; Gosney, William Milton; and Hall, Lou H., to Texas Instruments, Incorporated. Complementary insulated gate field effect devices. 3,673,679, Cl. 29-571.000.

Carbonetti, Emidio J., Jr.; and Conover, Lewis. Automated paint spray system. 3,674,207, Cl. 239-69.000.

Carbonnel, Jack V.; Grammont, Paul D.; and Werotte, Louis E., to Diamond Shamrok Corporation. Ion exchange resins. 3,674,728, Cl. 260-2.20r.

Carborundum Company, The: *See*—
Economy, James; Wohrer, Luis C.; and Mason, John H., 3,674,894.

Caretta, Renato; and Pacciarini, Antonio, to Industrie Pirelli S.p.A., mesne. Process for curing pneumatic tires. 3,674,899, Cl. 264-315.000.

Carey, John Gerard: *See*—
Colchester, John Edward; Carey, John Gerard; and Taylor, Michael David, 3,674,797.

Carl Zeiss-Stiftung; d/b/a: *See*—
Butscher, Karlheinz, 3,675,238.

Carlon Engineering Company, Incorporated: *See*—
Nielson, Lonnie R., 3,673,795.

Carlson, Dana Peter, to Du Pont de Nemours, E. I., and Company. Stabilized tetrafluoroethylene-fluoroolefin copolymers having methyl ester end-groups and process for producing same. 3,674,758, Cl. 260-87.5.

Carlson, Lee Allen, to Dennison Manufacturing Company. Electrophotographic reproduction sheet and composition containing photoconductive material and coarse filler particles. 3,674,477, Cl. 96-1.800.

Carlson, Richard K., to Bell & Howell Company. Automatic filter actuator for a cartridge load camera. 3,673,934, Cl. 95-11.000.

Carlsson, Per Arvid Emil: *See*—
Brandstrom, Arne Elof; Carlsson, Per Arvid Emil; Carlsson, Stig Ake Ingemar; Corrodi, Hans Rudolf; Ek, Lars; Lamm, Bo Robert; and Ablad, Bengt Arne, 3,674,840.

Carlsson, Stig Ake Ingemar: *See*—
Brandstrom, Arne Elof; Carlsson, Per Arvid Emil; Carlsson, Stig Ake Ingemar; Corrodi, Hans Rudolf; Ek, Lars; Lamm, Bo Robert; and Ablad, Bengt Arne, 3,674,840.

Carman, Kenneth K., to Koppers Company. Gear type coupling. 3,673,814, Cl. 64-8.000.

Carmichael, Alan, to Efco Limited. Conveyors. 3,674,130, Cl. 198-195.

Carrier Corporation: *See*—
McGrath, William L., 3,674,203.
Miller, Charlie D., 3,673,858.

Carter, Edward H., Jr.; Park, Vernon K.; and Seeger, Horst K., to Eastman Kodak Company. Process for polymerizing alpha-olefins. 3,674,765, Cl. 260-88.200.

Cartmell, James V.; and Churchill, Donald, to National Cash Register Company, The. Rear projection screen employing liquid crystals. 3,674,338, Cl. 350-117.000.

Casey, Ernest D.; and Sole, Lloyd H., to Ernest-Lloyd Limited. Magnetic pipeline pigs. 3,673,629, Cl. 15-104.06r.

Cash, David R., to Cash, James, Machine Co. Automatic border panel measuring and cutting machine. 3,673,906, Cl. 83-208.000.

Cash, James, Machine Co.: *See*—
Cash, David R., 3,673,906.

Cashin, William F.; and Mourning, James R., to Honeywell Inc. Humidity responsive element. 3,673,867, Cl. 73-337.000.

Castellano, Joseph Anthony; and Friel, Ronald Norman, to RCA Corporation. Liquid crystal display device including side-by-side electrodes on a common substrate. 3,674,342, Cl. 350-160.00r.

Catalyst Research Corporation: *See—*
Schneider, Alan A.; and Moser, James R., 3,674,562.

Caterpillar Tractor Company: *See—*
Audiffred, Sidney J.; Johnson, Lowell E.; and Pearce, Shairyl I., 3,673,799.
McMurray, Mitchell; Plouzek, Eugene A.; and Sturges, James R., 3,674,279.
Scholl, Rolland D., 3,675,169.
Weick, Louis F.; and Linne, William F., 3,673,796.

Cattermole, George R.; Cummings, Austin M.; and Lyerly, William M., to Du Pont de Nemours, E. I., and Company. Water-in-oil emulsion type blasting agent. 3,674,578, Cl. 149-2.000.

Catulle, Lyderic G., to S.A. Sodialox. Method for assembling together of frame sections. 3,673,674, Cl. 29-464.

Cauge, Thomas Peter: *See—*
Kocsis, Joseph; and Cauge, Thomas Peter, 3,675,092.

Caulfield, Henry John, to Sperry Rand Corporation. Space division multiplexed holographic apparatus. 3,674,331, Cl. 350-3.500.

Cavalucci, Ralph; and Walters, John, to American Science & Engineering. Demonstration compass. 3,673,706, Cl. 35-19.00a.

Celanese Corporation: *See—*
Kalnin, Ilmar L.; and Breckenridge, George J., 3,674,581.
Muratorio, Jorge R., 3,674,830.

Cencioni, Livio. Hinge for internal surface mounting, for doors of pieces of furniture or cabinet doors in general. 3,673,635, Cl. 16-163.000.

CER Geonuclear Corporation: *See—*
Knutson, Carroll F.; and Boardman, Charles Robert, 3,674,313.

Certain-Teed Products Corporation: *See—*
Heilmayr, Peter F.; Kimbrell, Sol B.; and Giuffre, Joseph C., 3,674,388.

Cerutti, Giacomo, to Bemberg S.p.A. Method for producing a thermoplastic synthetic yarn having a latent crimp. 3,673,650, Cl. 28-72.100.

Ceskoslovenska akademie ved: *See—*
Romanuk, Miroslav; Slama, Karel; and Sorm, Frantisek, 3,674,819.

CGR Medical Corporation, mesne: *See—*
Siedband, Melvin P.; Duffy, Philip A., Jr.; and James, Jack L., 3,675,020.

Chalk, David L., to Armco Steel Corporation. Non-ridging chromium stainless steel. 3,674,467, Cl. 75-126.00r.

Champion Incorporated: *See—*
Boassy, Emil J.; and Shanni, Vincent, 3,673,751.

Champion Spark Plug Company: *See—*
Kock, Erhard, 3,674,205.

Chandler Evans, Inc.: *See—*
Bock, Herbert G.; and Szerejko, Walter J., 3,673,762.

Chang, Charles H.; and Randall, David I., to RAF Corporation. Reaction of 1,3-butadiene and organic sulfonyl halides. 3,674,856, Cl. 260-607.00a.

Chapman, Brian M., to Time, Incorporated. Method for handling and positioning film. 3,674,367, Cl. 355-77.000.

Cheng, Ming T.: *See—*
Baldwin, Roger A.; and Cheng, Ming T., 3,674,742.

Chernotsky, Alan; and Satz, Richard, said Satz assor. to said Chernotsky. Sound movie projector. 3,674,345, Cl. 352-31.000.

Cherry Electrical Products Corporation: *See—*
Bedocs, Michael F., 3,674,970.
Long, Eric L., 3,674,966.

Chevron Research Company: *See—*
Fraser, G. Frank, 3,674,413.
Mitchell, David S.; Bridge, Alan G.; and Scott, John W., 3,674,682.
Richardson, Wallace L.; Kautsky, George J.; and Barusch, Maurice R., 3,674,826.
Thompson, Don D., 3,675,121.

Chicago Show Printing Company: *See—*
Krebs, Jimmie M., 3,674,156.

Chilton, Charles B., to Bendix Corporation, The. Commutated motor speed measuring means. 3,675,126, Cl. 324-168.000.

Chiola, Vincent; and Dodds, Phyllis R., to GTE Sylvania Incorporated. Process for removing copper from molybdenum. 3,674,464, Cl. 75-101.00r.

Chiyoda Kako Kensetsu Kabushiki Kaisha: *See—*
Washimi, Koichi; Kanbayashi, Masaaki; Kanai, Toshio; and Fujimori, Akihiro, 3,674,679.

Choisser, John P. Infra-red vidicon. 3,675,071, Cl. 315-10.000.

Christ, Herbert. Device for placing tiles on building walls or the like. 3,673,755, Cl. 52-749.000.

Christman, Charles P., to General Motors Corporation. Ball and socket electrical connector means. 3,675,187, Cl. 339-211.000.

Chromalloy American Corporation: *See—*
Prill, Arnold L.; and Tarkan, Stuart E., 3,674,575.

Chromy, Franz, to Hilti Aktiengesellschaft. Drill construction. 3,674,101, Cl. 175-389.000.

Chrysler Corporation: *See—*
Claunch, Robert W., 3,673,614.

Chrysler United Kingdom Limited: *See—*
Walker, Brian Allison, 3,674,967.

Chulak, William, to Northern Electric Company, Limited. Remote testing system for communication circuits. 3,674,947, Cl. 179-175.20r.

Chupp, John P.: *See—*
Darlington, Walter A.; and Chupp, John P., 3,674,849.

Churchill, Anthony Edward. Live attenuated Marek's disease virus vaccine for poultry. 3,674,861, Cl. 424-89.000.

Churchill, Donald: *See—*
Cartmell, James V.; and Churchill, Donald, 3,674,338.

Ciba Limited: *See—*
Lohse, Friedrich; Schmid, Rolf; Fisch, Willy; and Batzer, Hans, 3,674,746.

Ciba-Geigy AG: *See—*
Leitz, Wilfried, 3,673,761.

Ciba-Geigy Corporation: *See—*
Kern, Joerg, 3,674,811.
Marand, Jean, 3,674,212.
Mizzoni, Renat Herbert; and Blatter, Herbert Morton, 3,674,794.
Rajappa, Srinivasachari, 3,674,786.
Rutz, Hans; and Gubler, Kurt, 3,674,874.
Werner, Lincoln Harvey, 3,674,796.

Cincinnati Milling Machine Company, The: *See—*
Dunn, Donald, 3,674,720.

Circuit Foil Corporation: *See—*
Yates, Charles B., 3,674,656.

Cirillo, John, to Kidde, Walter, & Company, Inc. Incision irrigator for use during surgical procedures. 3,674,024, Cl. 128-234.000.

C.I.T.-Compagnie Industrielle des Telecommunications: *See—*
Jacob, Jean-Baptiste, 3,674,938.

Cities Service Company: *See—*
Callan, John E., 3,674,735.
Driscoll, Richard E.; and DeCuir, George L., 3,674,431.
Wyatt, Glenn O., 3,674,433.

Cities Service Oil Company: *See—*
Bandyopadhyay, Pratip, 3,674,092.
Filachek, Lawrence A.; and Rakow, Marvin S., 3,674,450.
Moore, Ted R., 3,674,089.

Citizen Watch Company Limited: *See—*
Tsuzuki, Akira; and Suzuki, Choken, 3,673,789.

Citroen S.A. (Automobiles Citroen, Berliet, Panhard): *See—*
Grosseau, Albert, 3,674,285.

Clachan, Margaret Loudon: *See—*
Shephard, Robert Basil; Clachan, Margaret Loudon; Kennedy, David Rankine; and Abbott, Terence Arnold, 3,674,531.

Clampitt, Bert H.: *See—*
Anspon, Harry D.; Clampitt, Bert H.; and Gilbert, Ronald E., 3,674,761.

Clark, Charles Keith: *See—*
Levington, Henry John; and Clark, Charles Keith, 3,673,846.

Clark, Thomas F., to Allis-Chalmers Manufacturing Company. Circuit interrupter closing resistors. 3,674,959, Cl. 200-144.0ap.

Claunch, Robert W., to Chrysler Corporation. Sewage disposal system with reusable flush medium. 3,673,614, Cl. 4-10.000.

Clay, Harris A., to Phillips Petroleum Company. Oxidative dehydrogenation process. 3,674,887, Cl. 260-680.00e.

Clayton, Rolf Crowther: *See—*
Arden, Thomas Victor; Borra, Albert George; and Clayton, Rolf Crowther, 3,674,685.

Clempson, Philip George, to Brownbuilt Limited. Continuous forming of transverse stifening ribs on strip material. 3,673,838, Cl. 72-187.000.

Clinehens, Richard M.; Stewart, John K., Jr.; and Ditmer, Robert W., to National Cash Register Company, The. Method of forming electrical conductors. 3,674,579, Cl. 156-5.000.

Clingenpeel, William R.; Cain, Charles L.; Hungerford, Philip C., Jr.; and Hayes, Robert R., to ESB Incorporated, mesne. Machine for casting battery intercell connectors. 3,674,085, Cl. 164-333.000.

Clow, William L.; Benzing, Robert J.; and McConnell, Bobby D., to United States of America, Air Force. Air drying silicone resin bonded dry film lubricant. 3,674,690, Cl. 252-25.000.

Coast Metals, Inc.: *See—*
Cape, Arthur T., 3,674,979.

Coats, John C.; and Wilson, George W., III, to Republic National Bank of Dallas Irving Trust Company and Union Bank. Variable setpoint proportional control appartus for vacuum bakeout systems. 3,674,984, Cl. 219-496.000.

Coffey, Peter E.: *See—*
Van Luik, Frank W.; and Coffey, Peter E., 3,674,435.

Colalillo, Edward P.: *See—*
Ricci, Vero; and Colalillo, Edward P., 3,673,960.

Colbaugh, Syril A. Lapidary machine. 3,673,742, Cl. 51-101.00r.

Colchester, John Edward; Carey, John Gerard; and Taylor, Michael David, to Imperial Chemical Industries Limited. Production of bisquaternary salts of 4:4'-bipyridyls. 3,674,797, Cl. 260-295.0am.

Cole, Edward N., to General Motors Corporation. Exhaust emission control. 3,674,441, Cl. 23-288.00f.

Cole, John F.: *See—*
Barrer, Richard M.; and Cole, John F., 3,674,709.

Cole Manufacturing Company: *See—*
Hatcher, John C., 3,673,970.

Coleman, Michael G.; and Huffman, Tommie R., to Motorola, Inc. Directed emission light emitting diode. 3,675,064, Cl. 313-108.

Colgate-Palmolive Company: *See—*
Simon, Jean Ellen, 3,674,135.

Collins, James W., Sr. Teaching aid. 3,674,905, Cl. 35-35.000.
Collins, Joseph John, to Union Carbide Corporation. Adsorption process for water and nitrogen oxides. 3,674,429, Cl. 23-159.000.
Collins Radio Company: *See—*
Melvin, William J., 3,675,129.
Collister, Frank C. Key bolt. 3,673,910, Cl. 85-3.00r.
Colorforms: *See—*
Birnkrant, Melvin, 3,673,909.
Columbus Electric Manufacturing Co.: *See—*
McCloskey, Fenimore G.; and Jordan, William Robert, 3,675,166.
Combustion Engineering, Inc.: *See—*
Anthony, Andrew J.; Gaines, Albert L.; and Krawiec, Donald M., 3,674,635.
Burrus, Bill S., 3,673,850.
Combustion Equipment Associates, Inc.: *See—*
Gleason, Thomas G., 3,673,769.
Commarmot, Roger, to Rhone-Poulenc S.A. Valve. 3,674,236, Cl. 251-176.000.
Commercial Envelope Manufacturers, Inc.: *See—*
Arnell, Alvin, 3,674,255.
Commissariat a l'Energie Atomique: *See—*
de Vaulchier Du Deschaux, Louis; de Fouchier, Alain; de Vaucelles, Emmanuel; and Facquet, Louis, 3,674,655.
Delafosse, Jacques; and Viaud, Jean-Luc, 3,674,637.
Jacob, Louis, 3,674,340.
Lavigne, Pierre, 3,675,031.
Commonwealth of Australia, care of Secretary Department of Supply, The: *See—*
Mc Allister, Lindsay G., 3,675,191.
Communications Satellite Corporation: *See—*
Standing, Arthur F., 3,675,138.
Compagnie des Montres Longines: *See—*
Berney, Jean Claude, 3,675,147.
Compagnie Generale des Etablissements Michelin raison sociale Michelin & Cie: *See—*
Lejeune, Daniel, 3,674,315.
Verdier, Henri, 3,674,077.
Compagnie Generale des Etablissements Michelin, raison Sociale Michelin & Cie: *See—*
Verdier, Henri, 3,674,080.
Compco Corporation: *See—*
Zagel, Samuel J.; and Patton, Thomas H., 3,675,006.
Computer Systems Engineering, Inc.: *See—*
Molloy, Kenneth H.; Ward, John P.; and Benson, Victor Mark, 3,675,196.
Congoleum Industries, Inc.: *See—*
Petry, Robert K.; and Shortway, Harry A., 3,674,611.
Connair, Michael John, to Du Pont de Nemours, E. I., and Company. Preparation of two-side coated photosensitive papers. 3,674,534, Cl. 117-34.000.
Conover, Lewis: *See—*
Carbonetti, Emidio J., Jr.; and Conover, Lewis, 3,674,207.
Consolidated Foods Corporation, mesne: *See—*
Gaudry, Paul E.; Gaudry, Edouard; Descarries, Raymond; and Anderson, James, 3,673,628.
Consonni, Alberto: *See—*
Baldratti, Giuliana; Consonni, Alberto; and Sciaky, Roberto, 3,674,817.
Container Graphics Corporation: *See—*
Saunders, Philip G., 3,673,929.
Continental Can Company, Inc.: *See—*
Ruekberg, Herbert S., 3,674,060.
Converters Incorporated: *See—*
Welch, Archibald H., 3,674,254.
Conveyor system for drive-in restaurants: *See—*
Kropf, Frederic F., 3,673,967.
Conwed Corporation: *See—*
Larsen, Ronald L., 3,674,898.
Cook, Russell E.: *See—*
Adams, Jay C.; and Cook, Russell E., 3,673,811.
Cook-Waite Laboratories, Inc.: *See—*
Melott, Norman W., 3,673,766.
Cooke, Robert F., to Unitec Industries, Inc. Wound filament ladder. 3,674,110, Cl. 182-46.000.
Cooley, Eugene A.: *See—*
Worstell, Wayne C.; Cousins, Richard C.; and Cooley, Eugene A., 3,674,119.
Cooper, Donno W. Tire chucking device. 3,674,067, Cl. 144-288.00a.
Cooper, Julius; and Nielsen, Edwin A., to Ideal Toy Corporation. Apparatus for starting and terminating a toy vehicle race. 3,674,269, Cl. 273-86.00r.
Cooper, Michael Henry; and Fryatt, Leslie Alva, to N.G.N. Limited. Microtome assemblies. 3,673,904, Cl. 83-171.000.
Copeland, Charles R., to General Motors Corporation. Engagement control of friction drives. 3,674,121, Cl. 192-52.000.
Copeland, George G., to Copeland Systems, Inc. Kraft liquor recovery system including physically isolated oxidation and reduction stages. 3,674,630, Cl. 162-30.000.
Copeland Systems, Inc.: *See—*
Copeland, George G., 3,674,630.
Coppola, Salvatore: *See—*
Formisano, Mario; and Coppola, Salvatore, 3,674,649.
Cordis Corporation: *See—*
Williamson, Donald E., 3,674,009.
Cornelius, Edward C.: *See—*
Blaisdell, William H.; and Cornelius, Edward C., 3,675,016.
Corrigan, Harry G. Cameras. 3,673,943, Cl. 95-24.000.
Corrodi, Hans Rudolf: *See—*
Brandstrom, Arne Elof; Carlsson, Per Arvid Emil; Carlsson, Stig Ake Ingemar; Corrodi, Hans Rudolf; Ek, Lars; Lamm, Bo Robert; and Ablad, Bengt Arne, 3,674,840.
Corson, Steve: *See—*
Abplanalp, George W.; and Corson, Steve, 3,675,034.
Cossaart, Darrel D.: *See—*
Tanaka, Edward Y.; Cossaart, Darrel D.; and Edwards, Norman B., 3,673,680.
Costello, Bernard J., to Argus Engineering Company, Inc. Heating and fusing device. 3,674,974, Cl. 219-85.000.
Cotugno, Dolores. Method of forming a ruffle or the like. 3,674,187, Cl. 223-46.000.
Coughlan, Edward H., to Polaroid Corporation. Drive system for a reflex member. 3,673,935, Cl. 95-11.00r.
Coulombe, Raymond Francis, to Dart Industries Inc. Dip coating machine. 3,673,984, Cl. 118-416.000.
Court, Otto: *See—*
Vernaleken, Hugo; Court, Otto; and Weirauch, Kurt, 3,674,740.
Cousins, Richard C.: *See—*
Worstell, Wayne C.; Cousins, Richard C.; and Cooley, Eugene A., 3,674,119.
Couture, John W., to Automation Industries, Inc. Magnetic pulser circuit for material tester. 3,673,859, Cl. 73-67.80r.
Cox, Ernest Francis, to Ronson Corporation. Divided flow hairdryer. 3,674,980, Cl. 219-367.000.
CPC International Inc.: *See—*
Gooding, Chester M., 3,674,821.
Meyer, Gilbert R.; and Everett, Rollo J., 3,674,555.
Crabtree, Ronald; and Horacek, Peter. Vehicle lifting device. 3,674,252, Cl. 269-55.000.
Crandell, Melvin G.: *See—*
Baller, Ernst O.; Crandell, Melvin G.; Pease, Donald L.; and Witinski, Francis D., 3,674,363.
Crane, Edward J., to International Agri-Systems, Inc. Poultry picker. 3,673,637, Cl. 17-11.100.
Craven, James M., to Du Pont de Nemours, E. I., and Company. Polyiminoquinazolinediones. 3,674,749, Cl. 260-77.5ch.
Cravener, James A. Tamper-proof lock for small arms. 3,673,725, Cl. 42-1.00r.
Creamer, Edward L.: *See—*
Stewart, Richard C.; and Creamer, Edward L., 3,674,469.
Creger, Paul L., to Parke, Davis & Company. 2,2-Dimethyl-ω-aryloxyalkanoic acids and salts and esters thereof. 3,674,836, Cl. 260-473.00g.
Crewe, John Mervyn, to Smith & Wesson Chemical Company, Inc. Airborne dispenser. 3,674,174, Cl. 221-87.000.
Cristol, Stanley J.; and Lee, George A., to Du Pont de Nemours, E. I., and Company, mesne. Photosynthesis of cyclopropyl compounds from allylic compounds. 3,674,665, Cl. 204-163.000.
Crook, Edward J., Jr., to American Hoist & Derrick Company. Hook and collar with gate. 3,674,301, Cl. 294-82.000.
Crook, Richard D., to Industrial Problem Solves, Inc. Vane ejector tool. 3,673,668, Cl. 29-254.000.
Crooks, James W., to Allis-Chalmers Manufacturing Company. Auxiliary transmission. 3,673,890, Cl. 74-681.000.
Cross, John H.: *See—*
Cain, James P.; and Cross, John H., 3,673,611.
Crossen, Kenneth R., to EG&G, Inc. Point light source. 3,675,069, Cl. 313-268.000.
Crowe, William P., to General Electric Company. Refrigerator cabinet with removable partition. 3,674,359, Cl. 312-214.000.
Crown Imports Co., Inc.: *See—*
Radding, Jason D., 3,674,308.
Cryogenic Technology, Inc.: *See—*
Bamberg, Walter H., 3,673,809.
CSF-Compagnie Generale de Telegraphite Sans Fil: *See—*
Brun, Henri, 3,675,067.
Cubberly, Walter E., Jr., to Schlumberger Technology Corporation. Methods and apparatus for detecting the entry of formation gases into a well bore. 3,673,864, Cl. 73-153.000.
Cullen, Allen F.: *See—*
Jeffery, Robert W.; Brown, Robert A., Jr.; and Cullen, Allen F., 3,673,978.
Cullen, Roy H.; and Elliott, Charles H., to Youngstown Sheet and Tube Company. Method for wire-wrapping pipe. 3,673,785, Cl. 57-161.000.
Culligan International Company: *See—*
Elliott, Eugene R.; and Freborg, Lehner C., 3,675,041.
Cummings, Austin M.: *See—*
Cattermole, George R.; Cummings, Austin M.; and Lyerly, William M., 3,674,578.
Curiel, Raymond F. Coiffeur decorating apparatus. 3,675,005, Cl. 240-2.000.
Curtis-Wright Corporation: *See—*
Larrinaga, John; and Jones, Charles, 3,674,384.
Curtiss, Robert H.; Holzman, Richard; and Lazarow, Seldan A., to Nortec Computer Devices, Inc. Means detecting non-rebailed print hammers to recycle the bailing means. 3,673,955, Cl. 101-93.00c.
Curwood, Inc.: *See—*
Mergy, James I., 3,674,626.
Customline Control Products, Inc.: *See—*
Wright, Edward L.; and Meseck, Eugene, 3,673,851.

Cuthbertson, John Harry: *See—*
Swanwick, Barry Frederick; West, Ernest; and Cuthbertson, John Harry, 3,673,819.

Cutler, Leonard S.: *See—*
Cutler, Leonard S.; Holloway, Joseph H.; and Turner, Wilson R., 3,675,149.

Cutler, Leonard S.; Holloway, Joseph H.; deceased (by Cutler, Leonard S.; executor Turner, Wilson R.); and Turner, Wilson R., to Hewlett-Packard Company. Atomic beam tube having multiple beams. 3,675,149, Cl. 331-94.000.

Cutler-Hammer, Inc.: *See—*
Allison, Arthur F.; Greening, Donald J.; and Mollgaard, Anton N., 3,675,104.

Dabringhausen, Friedhelm: *See—*
Korner, Gerhard; Schmitz, Wolfgang; Dabringhausen, Friedhelm; and Gruber, Lothar, 3,674,957.

Dabrowski, Jan: *See—*
Lyons, Richard J.; and Dabrowski, Jan, 3,674,418.

Dacey, Paul F.; De Toma, Samuel; Hayes, Thomas; and Mc Namara, Matthew F., to EDUS Corporation. Educational device. 3,673,712, Cl. 35-74.000.

Daguet, Jacques Lucien: *See—*
Bellanger, Maurice Georges; Daguet, Jacques Lucien; and Duong, Tuan Kiet, 3,674,937.

Dahlquist, John A.: *See—*
Growald, Bert; Dahlquist, John A.; and Marlor, Guy A., 3,674,711.

Daiichi Seiyaku Co., Ltd.: *See—*
Naito, Takeo; Hirata, Miyoshi; and Isoda, Sumiro, 3,674,833.

Daiichi Yakuhin Sangyo Kabushiki Kaisha: *See—*
Makabe, Kazuo, 3,674,823.

Daikin Kogyo Co., Ltd.: *See—*
Izumo, Masanori; and Yoshimura, Tatsushiro, 3,674,762.
Nakamura, Naoya; and Miyata, Yasuo, 3,674,763.

Dailey, Charles R., Jr., to General Tire & Rubber Company, The. Pneumatic tire tread design. 3,674,076, Cl. 152-209.00r.

Daimler-Benz Aktiengesellschaft: *See—*
Brugger, Franz; and Paul, Jurgen, 3,674,319.
Reisacher, Josef; Noltemeyer, Friedrich; and Dziggel, Reiner, 3,674,000.

Daly, Dante: *See—*
Giolitti, Nicolo; and Daly, Dante, 3,674,202.

Danbrova, Roger G. Fish lure. 3,673,728, Cl. 43-42.510.

Daniel, David W.; and Anthony, Russell W., to Lear Siegler, Inc. Indexable adjustable abutment. 3,673,887, Cl. 74-568.00r.

Danielmeyer, Hans Guenter, to Bell Telephone Laboratories, Incorporated. Laser pump cavity with conical geometry. 3,675,156, Cl. 331-94.500.

Daniels, Alma U., to Du Pont de Nemours, E. I., and Company. Titanium carbide-nickel compositions. 3,674,443, Cl. 29-182.800.

Danly Machine Corporation: *See—*
Heiberger, Francis E., 3,675,098.

Danti, Bernard, to Millipore Corporation. Check valve. 3,674,147, Cl. 210-136.000.

D'Aprile, Paul J., to Wiremold Company, The. Scuff strip for tow-element helically wound tubing. 3,674,056, Cl. 138-134.000.

Dardenne, Jean. Insulating tape and method of fabrication thereof. 3,674,615, Cl. 161-49.000.

Dare, Roy R.: *See—*
Randolph, Robert W.; and Dare, Roy R., 3,673,914.

Dark, Joe W.: *See—*
Barnett, Richard C.; Dark, Joe W.; and Schulze, James L., Sr., 3,674,005.

Darlington, Walter A.; and Chupp, John P., to Monsanto Company. 2',5-Dihalo-3-tert. alkyl-5-nitrosalicylanilides. 3,674,849, Cl. 260-559.00s.

Dart Industries Inc.: *See—*
Coulombe, Raymond Francis, 3,673,984.

Data Memory, Inc.: *See—*
Faroudja, Yves C., 3,674,920.

Dauber, Philip S.: *See—*
Arnold, Richard F.; Dauber, Philip S.; and Sussenguth, Edward H., 3,675,215.

Dauber, Philip S.; Robelen, Russell J.; and Wierzbicki, John R., to International Business Machines Corporation. Sequence interlocking and priority apparatus. 3,675,217, Cl. 340-172.5.

Davies, Daniel J.: *See—*
Manion, Jean P.; and Davies, Daniel J., 3,674,667.

Davies, Robert H., to Parker-Hannifin Corporation. Fluid motor. 3,673,925, Cl. 92-128.000.

Davies, Ronald C., to Modern Research Inc., mesne. Auto theft prevention system. 3,675,036, Cl. 307-10.0at.

Davies, Terence J.: *See—*
Nelson, Melvin A.; Lackey, Jerry G.; and Davies, Terence J., 3,675,022.

Davin, John Joseph. Construction support means. 3,674,234, Cl. 248-239.000.

Davis, Billy W., to Schlumberger Technology Corporation. Hoop stressed beam hydrophone. 3,675,193, Cl. 340-10.000.

Davis, Kenneth E., to Hobart Manufacturing Company, The. Analysis of comminuted meat products. 3,673,852, Cl. 73-15.400.

Davis, Terry R.: *See—*
Schaab, Carl K.; Weyrauch, George T.; and Davis, Terry R., 3,674,589.

Day, William C.: *See—*
Blank, Fritz; Day, William C.; Harmon, Sandra R.; Toncic, Pauline F.; and Yu, Ruey J., 3,674,645.

Dayco Corporation: *See—*
Huber, Walter E., 3,674,322.

De Barros, Fernando. Nivagational trapezoid. 3,673,690, Cl. 33-75.000.

De Brey, Robert J. Particle monitor. 3,674,316, Cl. 302-65.000.

De Clerk, Joseph L.: *See—*
Derderian, George; and De Clerk, Joseph L., 3,675,012.

de Fouchier, Alain: *See—*
de Vaulchier Du Deschaux, Louis; de Fouchier, Alain; de Vaucelles, Emmanuel; and Facquet, Louis, 3,674,655.

de Gelder, Jacob; Baginski, Albert R.; and Miller, Anthony D., to Mattel, Inc. Reversible surface tray assembly for a toy top. 3,674,271, Cl. 273-115.000.

De Rose, Kenneth M.: *See—*
Beckham, Robert R.; Walters, Emmett L.; Brown, Jack G.; De Rose, Kenneth M.; and Ryan, Joseph D., 3,673,981.

De Simone, David N., to United States of America, Navy. Protective helmet. 3,673,609, Cl. 2-3.00r.

De Toma, Samuel: *See—*
Dacey, Paul F.; De Toma, Samuel; Hayes, Thomas; and Mc Namara, Matthew F., 3,673,712.

de Vaucelles, Emmanuel: *See—*
de Vaulchier Du Deschaux, Louis; de Fouchier, Alain; de Vaucelles, Emmanuel; and Facquet, Louis, 3,674,655.

de Vaulchier Du Deschaux, Louis; de Fouchier, Alain; de Vaucelles, Emmanuel; and Facquet, Louis, to Commissariat a l'Energie Atomique. Surface preparation of uranium parts. 3,674,655, Cl. 204-1.500.

de Villeneuve, Yolande-Paule Marie-Josephe: *See—*
Phlipot, Georges A.; Michiels, Marie-Jose-Suzanne and; and de Villeneuve, Yolande-Paule Marie-Josephe, 3,674,745.

Deal, Joseph D., Jr.; and Michie, James C., III, to Newport News Shipbuilding and Dry Dock Company. Method of maritime delivery of crude oil through ice-congested regions. 3,674,042, Cl. 137-1.000.

Dean, Warren E.; and Dorsett, Charles M., to PPG Industries, Inc. Mercury removal. 3,674,428, Cl. 23-134.000.

Decca Limited: *See—*
Hendley, Dennis Alfred, 3,673,977.

Decision Data Corporation: *See—*
Petusky, Neil J., 3,675,172.

Decker, Herbert; and Waldenburger, Hermann, to Triumph Werke Nurnberg AG. Type head drive. 3,674,126, Cl. 197-55.000.

DeCuir, George L.: *See—*
Driscoll, Richard E.; and DeCuir, George L., 3,674,431.

Decupper, Jean A., to Detec S.A. Apparatus for purifying and sterilizing premises. 3,674,421, Cl. 21-74.00r.

Dee, Kenneth Herbert William: *See—*
Huber, Manfred; Klimek, Norbert; and Dee, Kenneth Herbert William, 3,673,956.

Deeg, Emil W.; and Graf, Robert E., to American Optical Corporation. Optical glasses having improved spectral transmission produced from mercury nitrate containing glass batches. 3,674,530, Cl. 106-47.00q.

Deere & Company: *See—*
Egli, John Alfred, 3,674,105.
Holzhfi, Don Earl, 3,673,772.
Jones, Frank D. Lloyd, 3,673,775.
Nelson, Roger John, 3,674,095.

Deering Milliken, Inc.: *See—*
Mienstaedt, Robert, 3,674,993.

Deering Milliken Research Corporation: *See—*
Cain, James P.; and Cross, John H., 3,673,611.
Gagarine, Dmitry M., 3,674,548.
Klein, Norman E., 3,674,584.
Otto, Wolfgang Karl Ferdinand, 3,674,417.
Varner, George C., 3,674,079.

Degenkolbe, Joachim; and Musgen, Bruno, to Huttenwerk Oberhausen AG. Fabrication of steel structures by welding. 3,674,577, Cl. 148-143.000.

Degginger, Edward R.; and Goetz, Frederick J., to Allied Chemical Corporation. Process for controlling nematodes. 3,674,878, Cl. 424-330.000.

Delafosse, Jacques; and Viaud, Jean-Luc, to Commissariat a l'Energie Atomique. Spacer grid for nuclear reactor fuel element assembly. 3,674,637, Cl. 176-78.000.

DeLaval Turbine, Inc.: *See—*
Brimmer, Donald B.; Brown, James Stuart; and Becker, Charles H., 3,674,686.

Delta Data Systems Corporation: *See—*
Bard, Irving Gary, 3,675,208.

Demler, Henry William, Sr., to AMP Incorporated. Tubular connection devices. 3,674,292, Cl. 285-174.000.

Dening, Robert D.; and Garlinghouse, Leslie H., to Garlinghouse Brothers Manufacturing Co. Self-supporting compactor. 3,673,931, Cl. 94-45.00a.

Dennewitz, Rolf Dictor, to Loewe Opta GmbH. Transistorized quenching arrangement for a duration-controlled flash tube. 3,675,074, Cl. 315-159.000.

Dennison Manufacturing Company: *See—*
Carlson, Lee Allen, 3,674,477.

Derderian, George; and De Clerk, Joseph L., to United States of America, Navy. Cinefluorographic holography. 3,675,012, Cl. 250-60.000.

Derrien, Michel; and Le Page, Jean Francois, to Institut Francais du Petrole des Carburants et Lubrifiants. Process for selectively hydrogenating unsaturated hydrocarbons. 3,674,888, Cl. 260-681.500.

Derry, Wendell A. Keyboard transposition of electrical musical instruments. 3,674,907, Cl. 84-1.010.

Des Jardins, James, to Emerson Electric Co. Self-ejecting chuck key. 3,673,895, Cl. 81-90.00a.

Descarries, Raymond: *See—*
Gaudry, Paul E.; Gaudry, Edouard; Descarries, Raymond; and Anderson, James, 3,673,628.

Desty, Denis Henry; and Whyman, Barry Herbert Francis, to British Petroleum Company Limited, The. Burners having a pulsating mode of operation. 3,674,409, Cl. 431-1.000.

Detec S.A.: *See—*
Decupper, Jean A., 3,674,421.

Dethlefsen, Rolf: *See—*
Attia, Edward A.; and Dethlefsen, Rolf, 3,674,958.

Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See—*
Illigen, Alfred; and Neugebauer, Walter, 3,674,430.

Dewey, Raymond D.; Mapes, Robert S.; and Jones, Garth S., to Reynolds Metals Company. Feature counter with improved masking and grey level detection. 3,674,926, Cl. 178-6.800.

Di Crispino, Joseph S.; and Kaldor, Leslie M., to United States of America, Navy. Triaxial stress test apparatus. 3,673,862, Cl. 73-102.000.

Diamond, Clyde, Sr. Adjustable archery sight. 3,674,002, Cl. 124-30.00r.

Diamond Laboratories, Inc.: *See—*
Welter, Clarence J.; and Ristic, Miodrag, 3,674,860.

Diamond Shamrock Corporation: *See—*
Carbonnel, Jack V.; Grammont, Paul D.; and Werotte, Louis E., 3,674,728.
Fogelman, Edward I., 3,674,676.
Lukes, James J.; and Koll, Robert J., 3,674,881.
Sellet, Lucien, 3,674,415.

Diazit Company Inc.: *See—*
Neeb, Robert P.; and Patrick, Henry W., 3,674,257.

Dick, A. B., Company: *See—*
Averbach, Alexander U., 3,674,693.
Stone, J. James, Jr.; Madden, Thomas J., Jr.; Gerlach, Glendon T.; and Keur, Robert I., 3,673,936.

Dickey, Thomas A., to Avco Corporation. Multi-channel particle separator. 3,673,771, Cl. 55-306.000.

Diebold, James L.: *See—*
Wolf, Milton; and Diebold, James L., 3,674,790.

Dietrich, John W.: *See—*
Ripsco, William B.; and Dietrich, John W., 3,673,824.

Digital Data Systems, Inc., mesne: *See—*
Block, Donald Edmund; and Alexakis, Nicholas George, 3,675,210.

Digital Equipment Corporation: *See—*
White, Donald A., 3,675,083.

Dijkhuizen, Willem; Termin, Erich; Bleh, Otto; and Morgenstern, Dieter, to Dynamit Nobel Aktiengesellschaft. Manufacture of polyurethanes using organic vanadium compounds as catalysts. 3,674,716, Cl. 260-2.5ab.

Dillingham Corporation: *See—*
Worstell, Wayne C.; Cousins, Richard C.; and Cooley, Eugene A., 3,674,119.

Dills, Marguerite B. Teaching device. 3,673,704, Cl. 35-8.

Dills, Raymond L.: *See—*
Hurko, Bohdan; and Dills, Raymond L., 3,674,983.

Diolot, Lucien, to Societe Nouvelle Spidem. Rolling method using prestressing. 3,673,843, Cl. 72-245.000.

Dippolhofer, Robert: *See—*
Schnegg, Robert; Pelousek, Herbert; Dippolhofer, Robert; Wiegreffe, Wolfgang; Voelz, Hans-Georg; and Kienast, Gerhard, 3,674,747.

Ditmer, Robert W.: *See—*
Clinehens, Richard M.; Stewart, John K., Jr.; and Ditmer, Robert W., 3,674,579.

Dittel, Friedrich; and Jorns, Peter, to Hooker Chemical Corporation. Noncorrosive cleaning composition and process. 3,674,699, Cl. 252-135.000.

Diversified Medical Corporation: *See—*
Falenks, John, 3,674,010.

Dixon, Alton E.: *See—*
Gooding, Otis E.; and Dixon, Alton E., 3,674,934.

Dodd, John Alton, Jr.; and Line, George Harry, to RCA Corporation. Method of making matching photoprinting masters. 3,674,488, Cl. 96-44.000.

Dodds, Phyllis R.: *See—*
Chiola, Vincent; and Dodds, Phyllis R., 3,674,464.

Dodgson, Hugh, to Moore Business Forms, Inc. Multiple form with removable tabs. 3,674,286, Cl. 281-2.000.

Dogadkin, Boris Aristarkhovich: *See—*
Bokov, Jury Sergeevich; Vikulina, Ninel Vladimirovna; Dogadkin, Boris Aristarkhovich; Erofeev, Boris Vasilievich; Larina, Anastasia Vasilievna; Lavrischev, Vadim Petrovich; Markov, Vladimir Vladimirovich; Naumova, Sofia Fadeevna; Jurina, Olge Demidovna; and Yarovaya, Galina Dmitrievne, 3,674,496.

Dohmeier & Strothotte KG: *See—*
Dohmeier, Arnold; and Schwedhelm, Diether, 3,673,765.

Dohmeier, Arnold; and Schwedhelm, Diether, to Dohmeier & Strothotte KG. Packaging device. 3,673,765, Cl. 53-187.000.

Dohogne, Linus E.: *See—*
Koehler, Albert T.; Shideler, Paul J.; and Dohogne, Linus E., 3,673,950.

Doi, Masaru: *See—*
Iemura, Toshio; Doi, Masaru; and Shimizu, Yoshiaki, 3,674,944.

Dols, Wilhelmus Emilius Maria, to Van Der Grinten N.V. Development apparatus for electrophotographic copies. 3,673,985, Cl. 118-637.000.

Dominion Bridge Company Limited: *See—*
Graville, Brian Anthony, 3,674,973.
Hagen, William Dobson, 3,673,658.
Mutch, Robert Douglas, 3,674,302.

Donalson, Alton E. Plumbing grate fixture. 3,674,149, Cl. 210-163.000.

Donini, Pietro, to Istituto Farmacologico Serono S.p.A. Procedure for obtaining pituitary gonadotropic hormones from urine. 3,674,865, Cl. 424-99.000.

Doonan Truck & Equipment, Inc.: *See—*
Doonan, Wendell M.; and Knobloch, Ronald E., 3,674,303.

Doonan, Wendell M.; and Knobloch, Ronald E., to Doonan Truck & Equipment, Inc. Livestock trailer. 3,674,303, Cl. 296-24.00c.

Doran, Leo F.; and Schlenker, Theodore R., to Beaver Precision Products, Inc. Ball spline assembly. 3,673,817, Cl. 64-23.700.

Dorfmann, Oskar, to Grand-City Container Corporation. Carton erecting and packaging machine. 3,673,763, Cl. 53-183.000.

Dorsett, Charles M.: *See—*
Dean, Warren E.; and Dorsett, Charles M., 3,674,428.

Dounoucos, Angelo, to General Electric Company. Integrated system for generating oxygen and controlling carbon dioxide concentration in closed circuit breathing apparatus. 3,674,022, Cl. 128-142.000.

Dove, Ernest Baker, to Teleflex Products Limited. Safety seats for automobiles and aircraft. 3,674,307, Cl. 297-284.000.

Dow Chemical Company, The: *See—*
Bubblitz, Donald E., 3,674,789.
Drasner, Joseph, 3,674,597.
Dunbar, Joseph E.; and Zemba, John W., 3,674,795.
Gibbons, Carl L., 3,674,812.
La Barge, Robert G.; and Johnson, Gary L., 3,674,858.
Larsen, Eric R.; Keller, Albert Kent; and Plepys, Raymond A., 3,674,664.
Nowak, Robert M.; and Ginter, Thomas O., 3,674,893.
Reifschneider, Walter, 3,674,857.

Doyle, Richard H., to Fastener Corporation. Fastener driving tool. 3,673,922, Cl. 91-422.000.

Doyle, Walter M. Shielded pyroelectric detector apparatus and method. 3,675,017, Cl. 250-83.30h.

Dracon Industries: *See—*
Drake, King B., 3,675,183.

Drake, King B., to Dracon Industries. Telephone cord terminal block. 3,675,183, Cl. 339-103.00r.

Drasner, Joseph, to Dow Chemical Company, The. Chlorinated polyethylene-organic polyisocyanate adhesive for laminating chlorinated polyolefin film or sheet materials to fabric. 3,674,597, Cl. 156-331.000.

Drehman, Lewis E.: *See—*
Box, E. O., Jr.; Drehman, Lewis E.; and Farha, Floyd E., Jr., 3,674,706.

Dreisin, Alexander, to Allis-Chalmers Manufacturing Company. Fuel injection pump timing and metering arrangement. 3,673,996, Cl. 123-139.0ap.

Dresser Industries, Inc.: *See—*
Harper, James C., 3,673,974.

Driesenga, Edwin J.: *See—*
Van Ryn, Edwin; and Driesenga, Edwin J., 3,673,634.

Driscoll, Richard E.; and DeCuir, George L., to Cities Service Company. Generation of silicon tetrafluoride. 3,674,431, Cl. 23-205.000.

Driscoll, Rosemary F. Laundering clasp. 3,673,639, Cl. 24-16.0pb.

Drown, George C., 1/2 to Larson, Leward M. Vehicle tire air pressure monitoring system. 3,675,198, Cl. 340-58.000.

Druschel, William O., to International Business Machines Corporation. Mask overlay checking means. 3,674,487, Cl. 96-41.000.

DSO 'Avtomatizatsia I Priborostroene': *See—*
Tsvetkov, Krum Kostov; Ezekiev, Ezekiya Gueorguiev; Nikolov, Petko Petrov; and Otsetov, Vassil Christov, 3,674,991.

Du Pont de Nemours, E. I., and Company: *See—*
Alder, Hanspeter, 3,674,560.
Aldridge, Gerald Richard; Ehrich, Felix Frederick; and Struve, William Scott, 3,674,814.
Angelo, Rudolph John, 3,674,627.
Audermarsh, Carl Albert, Jr.; and Fogiel, Adolf Wojciech, 3,674,721.
Bellis, Harold Edward, 3,674,447.
Carlson, Dana Peter, 3,674,758.
Cattermole, George R.; Cummings, Austin M.; and Lyerly, William M., 3,674,578.
Connair, Michael John, 3,674,534.
Craven, James M., 3,674,749.
Daniels, Alma U., 3,674,443.
Hytrek, Frederick Paul, 3,674,705.
Jenkins, Francis Edward, 3,674,719.
Kelemen, Denis G., 3,674,515.
Parker, Fred W., 3,674,734.
Self, James M., 3,674,526.

Strolle, Clifford Hugh, 3,674,545.
Du Pont de Nemours, E. I., and Company, mesne: *See*—
Cristol, Stanley J.; and Lee, George A., 3,674,665.
Duffy, Philip A., Jr.: *See*—
Siedband, Melvin P.; Duffy, Philip A., Jr.; and James, Jack L., 3,675,020.
Dugger, Cortland O., to United States of America, Air Force. Process for the synthesis of glass and single crystal germanates of identical composition. 3,674,455, Cl. 65-134.000.
Duguay, Michel Albert; and Hansen, John Wilfred, to Bell Telephone Laboratories, Incorporated. Dispersion compensation in lasers. 3,675,154, Cl. 331-94.500.
Dukes, John N., to Hewlett-Packard Company. Temperature compensation of a laser interferometer. 3,674,371, Cl. 356-106.000.
Dunbar, Glenn G., to Allied Tube & Conduit Corporation. Material transporting apparatus. 3,674,166, Cl. 214-501.000.
Dunbar, Joseph E.; and Zemba, John W., to Dow Chemical Company, The. Pyridyl xanthates. 3,674,795, Cl. 260-294.80e.
Dunn, Donald, to Cincinnati Milling Machine Company, The. Process for mixing coreactive liquids which form polyurethanes. 3,674,720, Cl. 260-2.5bc.
Duong, Tuan Kiet: *See*—
Bellanger, Maurice Georges; Daguet, Jacques Lucien; and Duong, Tuan Kiet, 3,674,937.
Duplex, Paul: *See*—
Globus, Anatol; Duplex, Paul; and Vautier, Roger, 3,674,218.
Durbin, George A. Juice extracting device. 3,673,952, Cl. 100-98.000.
Duro-Test Corporation: *See*—
Strauss, Herbert S., 3,675,068.
Dusik, Josef: *See*—
Havranek, Milan; Zouhar, Drahomir; Dusik, Josef; Kucera, Jaromir; and Krejcirik, Jiri, 3,673,818.
Dutton, John C., to General Electric Company. High voltage coil assembly for electric induction apparatus. 3,675,175, Cl. 336-70.000.
Duve, Gunther: *See*—
Oberst, Hermann; Ebigt, Joachim; Duve, Gunther; and Schommer, Alfred, 3,674,624.
Oberst, Hermann; Ebigt, Joachim; Duve, Gunther; and Schommer, Alfred, 3,674,625.
Dwyer, James L.: *See*—
Post, Arthur H., Jr.; Polinsky, Ronald J.; and Dwyer, James L., 3,674,678.
Dyckerhoff & Widmann: *See*—
Finsterwalder, Ulrich; Finsterwalder, Klemens; and Stefaniak, Hans, 3,673,624.
Dyer, H. Daniel, III. Auxiliary lighting system. 3,675,038, Cl. 307-66.000.
Dyna-Jet Corporation, The: *See*—
Gage, Frank H.; and Zabel, Marvin L., 3,674,211.
Dynamics Corporation of America: *See*—
Smith, Peter B., 3,675,112.
Dynamit Nobel Aktiengesellschaft: *See*—
Dijkhuizen, Willem; Termin, Erich; Bleh, Otto; and Morgenstern, Dieter, 3,674,716.
Wittholz, Helge, 3,673,916.
Dziggel, Reiner: *See*—
Reisacher, Josef; Noltemeyer, Friedrich; and Dziggel, Reiner, 3,674,000.
Earing, Mason H., to General Electric Company. Thermal-overload protective arrangement for inductive devices. 3,675,081, Cl. 317-15.000.
Early, Robert M.; and Raes, Maurice C., to Olin Corporation. Dielectrically heat sealable polyurethane foam. 3,674,718, Cl. 260-2.5aq.
Eastman Kodak Company: *See*—
Blaisdell, William H.; and Cornelius, Edward C., 3,675,016.
Carter, Edward H., Jr.; Park, Vernon K.; and Seeger, Horst K., 3,674,765.
Eldredge, Carl H.; and Mee, John D., 3,674,782.
Harvey, Donald M., 3,673,939.
Harvey, Donald M., 3,673,940.
Jarvis, James G., 3,673,961.
Jeffreys, Roy A.; and Thomas, David A., 3,674,493.
Michatek, Chester W.; and Harvey, Donad M., 3,673,938.
Morse, Theodore H., 3,674,532.
Phlipot, Georges A.; Michiels, Marie-Jose-Suzanne and; and de Villeneuve, Yolande-Paule Marie-Josephe, 3,674,745.
Staiger, Ulrich, 3,674,350.
Streicher, Heinz; Riek, Siegfried; and Leutwein, Manfred, 3,674,351.
Trachtenberg, William, 3,674,353.
Webb, Richard V.; and Batesky, Donald C., 3,674,805.
Williams, Francis A., 3,673,941.
Eberle, Gunter. Receptacle holder for centrifuges. 3,674,198, Cl. 233-26.000.
Ebigt, Joachim: *See*—
Oberst, Hermann; Ebigt, Joachim; Duve, Gunther; and Schommer, Alfred, 3,674,624.
Oberst, Hermann; Ebigt, Joachim; Duve, Gunther; and Schommer, Alfred, 3,674,625.
Eclipse Sleep Products, Inc.: *See*—
Kline, John C.; and Kronman, Albert F., 3,673,619.
Economy, James; Wohrer, Luis C.; and Mason, John H., to Carborundum Company, The. Unsaturated polyester resins modified with organic dibasic acid salts. 3,674,894, Cl. 260-875.000.
Edenhofer, Albrecht; and Spiegelberg, Hans, to Hoffmann-La Roche Inc. [4'-(Phenyl-3,6-dihydro-1-(2H)-pyridyl]-2-hydroxy propoxyanilides and derivatives thereof. 3,674,799, Cl. 260-294.80f.
Edmiston, Dorothy Byars. Threshing implements. 3,674,035, Cl. 130-10.000.
Edstrom, Woodrow O.; and Norling, Charles H., to Sperry Rand Corporation. Method of making side entry card guides. 3,673,669, Cl. 29-428.000.
EDUS Corporation: *See*—
Dacey, Paul F.; De Toma, Samuel; Hayes, Thomas; and Mc Namara, Matthew F., 3,673,712.
Edwards, Alan: *See*—
Loukes, David Gordon; and Edwards, Alan, 3,674,453.
Edwards, John A.; Fried, John H.; and McCrae, William, to Syntex Corporation. Annulene steroids, intermediates, and method of making. 3,674,816, Cl. 260-397.400.
Edwards, Lon E., to Solitron Devices, Inc. Random noise generator diode with impedance matched transistor amplifier. 3,675,148, Cl. 331-78.000.
Edwards, Norman B.: *See*—
Tanaka, Edward Y.; Cossaart, Darrel D.; and Edwards, Norman B., 3,673,680.
Efco Limited: *See*—
Carmichael, Alan, 3,674,130.
EG&G, Inc.: *See*—
Crossen, Kenneth R., 3,675,069.
Egashira, Hiroshi: *See*—
Osaki, Keisuke; Egashira, Hiroshi; and Hayashi, Yasunori, 3,675,206.
Eggert, Walter S., Jr., to Boothe Airside Systems, Inc., mesne. Method of assemblying a vehicle body. 3,673,675, Cl. 29-469.000.
Egli, John Alfred, to Deere & Company. Drive axle for wide-track crawler vehicles. 3,674,105, Cl. 180-9.480.
Egnaczak, Raymond K., to Xerox Corporation. Cleaning apparatus. 3,673,632, Cl. 15-316.000.
Ehrich, Felix Frederick: *See*—
Aldridge, Gerald Richard; Ehrich, Felix Frederick; and Struve, William Scott, 3,674,814.
Eirich, Wilhelm; and Airich, Gustav. Mixing machine. 3,674,241, Cl. 259-15.000.
Eisenhauer, Leigh E.: *See*—
Eisenhauer, William A., 3,673,710.
Eisenhauer, William A.: *See*—
Eisenhauer, William A., 3,673,710.
Eisenhauer, William A., to Eisenhauer, William A., Eisenhauer, William P., Trust, Ida J. and Eisenhauer, Leigh E. Apparatus for providing a representation of celestial bodies. 3,673,710, Cl. 35-44.000.
Eisenhauer, William P.: *See*—
Eisenhauer, William A., 3,673,710.
Ek, Lars: *See*—
Brandstrom, Arne Elof; Carlsson, Per Arvid Emil; Carlsson, Stig Ake Ingemar; Corrodi, Hans Rudolf; Ek, Lars; Lamm, Bo Robert; and Ablad, Bengt Arne, 3,674,840.
El Chico Corporation: *See*—
Pomara, Johnny B., Jr., 3,674,178.
Elco Corporation: *See*—
Ruehlemann, Herbert E.; and Wontorsky, Alexander, 3,675,185.
Eldredge, Carl H.; and Mee, John D., to Eastman Kodak Company. Intermediates and the preparation and use thereof. 3,674,782, Cl. 260-240.400.
Electrohome Limited: *See*—
Fichtner, Roland H., 3,675,142.
Electronic Associates Inc.: *See*—
Horbach, Stephen, 3,675,174.
Electronic Memories and Magnetics Corporation: *See*—
Harding, Philip A., 3,675,221.
Elitex Zavody textilniho strojirenstvi generalni reditestvi: *See*—
Havlas, Jiri; and Sedlarik, Jaroslav, 3,673,649.
Elitex-Zavody textilniho strojirestvi, generalni: *See*—
Havranek, Milan; Zouhar, Drahomir; Dusik, Josef; Kucera, Jaromir; and Krejcirik, Jiri, 3,673,818.
Ellenberger & Poensgen GmbH: *See*—
Ellenberger, Jakob, 3,675,177.
Ellenberger & Poensgen GmbH: *See*—
Ellenberger, Jakob, 3,674,952.
Ellenberger, Jakob, 3,675,167.
Ellenberger, Jakob, to Ellenberger & Poensgen GmbH. Lockswitch. 3,674,952, Cl. 200-61.640.
Ellenberger, Jakob, to Ellenberger & Poensgen GmbH. Switch overload. 3,675,167, Cl. 335-179.000.
Ellenberger, Jakob, to Ellenberger & Poenegen GmbH. Safety switch. 3,675,177, Cl. 337-66.000.
Ellers, Frederick S.; Small, Sam W.; and Serpas, Luis B., to Bechtel International Corporation. Offshore loading and unloading of tankers. 3,674,062, Cl. 141-387.000.
Elliott, Charles H.: *See*—
Cullen, Roy H.; and Elliott, Charles H., 3,673,785.
Elliott, Eugene R.; and Freborg, Lehner C., to Culligan International Company. Regeneration control and timer system. 3,675,041, Cl. 307-141.000.
Elliott, James O., to General Motors Corporation. Segment wipe control for windshield wiper system. 3,675,103, Cl. 318-281.000.

Ellis, David R.; Michels, John; and Gabbert, Ira, to Interdata, Incorporated. Processor servicing external devices, real and stimulated. 3,675,214, Cl. 340-172.500.

Ellis, Forest M. Body attached stilts with vertically adjustable steps. 3,673,615, Cl. 3-4.000.

Elsner, Nils Ake; and Nilson, Hans Erik, to Infrarodteknik AB. Method for packing carbonated beverages into containers using electromagnetic energy. 3,674,513, Cl. 99-217.000.

Emanuel, Nikolai Markovich: *See*—
Bljumberg, Erna Albertovna; Bobolev, Alexandr Vasilievich; Boboleva, Svetlana Pavlovna; and Emanuel, Nikolai Markovich, 3,674,813.

Emerson Electric Co.: *See*—
Des Jardins, James, 3,673,895.

Emerson, William A.; and Redmond John A., to United States Steel Corporation. Induction heating coil constructed to minimize vibration and noise. 3,674,971, Cl. 219-10.790.

Emhart Corporation: *See*—
Prete, John A.; and Raudat, John L., 3,673,756.

Energy Absorption Systems, Inc.: *See*—
Young, Bruce O.; Walker, Grant W.; Ford, Duane B.; and Seegmiller, Wan, 3,674,115.

Energy Conversion Devices, Inc.: *See*—
Neale, Ronald G., 3,675,090.

Engelhard Hanovia, Inc.: *See*—
Highberg, Carle W., 3,673,746.

Engelhardt, Hans: *See*—
Rohde, Robert P.; Welsh, Clarence E.; and Engelhardt, Hans, 3,674,385.

Engle, Gordon A., to Honeywell Inc. Stainless steel snap acting mechanism with low resistance electrical path. 3,674,969, Cl. 200-166.00c.

English Clays Lovering Pochin & Company Limited: *See*—
Noble, Frank Raymond, 3,674,521.

English Clays Lovering Pochin & Company Limited: *See*—
Malden, Peter James, 3,674,558.
Toms, Gerald Lance, 3,674,529.

English, Dolores J. Method of and apparatus for visual instruction. 3,673,711, Cl. 35-62.000.

English Numbering Machines Limited: *See*—
Huber, Manfred; Klimek, Norbert; and Dee, Kenneth Herbert William, 3,673,956.

English, William D.: *See*—
Randle, Walter N.; Spieth, Howard H.; and English, William D., 3,673,871.

Ensley, Donald L., to U.S. Atomic Energy Commission under the provisions of 42 U.S.C. 2182. Cryogenic sound supported inertial reference. 3,673,872, Cl. 73-505.000.

Entron, Inc.: *See*—
Lankford, Barre D.; and Lanham, Charles W., 3,675,181.

Entschel, Roland; and Steinemann, Willy, to Sandoz Ltd.; a/k/a and Sandoz A.G. Basic phenylazophenyl dyes containing a quaternized aminoalkylenecarboxamide group. 3,674,772, Cl. 260-207.000.

Environment/One Corporation: *See*—
Allen, Merton, 3,673,733.

Eppler, Daniel, to Thomas & Betts Corporation. Extrusion tool. 3,674,392, Cl. 425-109.000.

Eppolito, Salvatore J. Shaping and ribbing tool for bowling ball finger holes. 3,673,685, Cl. 30-142.000.

Erba, Carlo, S.p.A.: *See*—
Angelucci, Romano, 3,674,864.

Erdman, William Charles, to Bell Telephone Laboratories, Incorporated. Zirconium mask for semiconductor fabricated using alkaline etchants. 3,674,580, Cl. 156-13.000.

Erdmann, M. Otto, to International Telephone and Telegraph Corporation. Snow and ice removal system for an antenna. 3,674,215, Cl. 239-548.000.

Erdolchemie Gesellschaft mit beschrankter Haftung: *See*—
Schleppinghoff, Bernhard; Scherb, Helmut; and Puxbaumer, Hans, 3,674,883.

Erickson, John W. Centrifugal pump for operating at low suction head. 3,674,378, Cl. 416-177.000.

Erikson, J. Alden; and Gacesa, Gerald R., to PPG Industries, Inc. Coating method. 3,674,670, Cl. 204-181.000.

Eriksson, Bjorn Sven Hilding: *See*—
Mattsson, Mats Erik; Eriksson, Bjorn Sven Hilding; and Lindelow, Claes-Goran, 3,674,199.

Ernest-Lloyd Limited: *See*—
Casey, Ernest D.; and Sole, Lloyd H., 3,673,629.

Erni, Heinrich H., to Allis-Chalmers Manufacturing Company. Puffer type circuit interrupter. 3,674,956, Cl. 200-148.00a.

Erofeev, Boris Vasilievich: *See*—
Bokov, Jury Sergeevich; Vikulina, Ninel Vladimirovna; Dogadkin, Boris Aristarkhovich; Erofeev, Boris Vasilievich; Larina, Anastasia Vasilievna; Lavrischev, Vadim Petrovich; Markov, Vladimir Vladimirovich; Naumova, Sofia Fadeevna; Jurina, Olge Demidovna; and Yarovaya, Galina Dmitrievne, 3,674,496.

Esaka, Teruo, to Okamoto Chemical Industry Company Limited. Sensitizing layer. 3,674,495, Cl. 96-91.00r.

Esaki, Hideya: *See*—
Naomoto, Susumu; Kaneko, Tadataka; and Esaki, Hideya, 3,675,091.

ESB Incorporated: *See*—
Bergum, Bernard C.; and Kenyon, Kenneth H., 3,674,565.

ESB Incorporated, mesne: *See*—
Clingenpeel, William R.; Cain, Charles L.; Hungerford, Philip C., Jr.; and Hayes, Robert R., 3,674,085.

Esso Production Research Company: *See*—
Lock, Everett H.; and Heilhecker, Joe K., 3,673,676.

Esso Research and Engineering Company: *See*—
King, Laurence F., 3,674,730.
Lyon, Richard K., 3,674,681.
Robson, Harry Edwin, 3,674,425.
Scher, Herbert I.; and Ungar, Israel S., 3,674,619.
Starnes, William H., Jr., 3,674,854.
Vanderbilt, Byron M.; and Fasnacht, James J., 3,674,542.
Welty, Albert B., Jr., 3,674,427.

Estes, Joseph F.; and Kertesz, Imre, to North American Rockwell Corporation. Sensing instrument havng a cantilevered proof mass. 3,673,873, Cl. 73-517.000.

Esty, Joseph J. Method of packaging and preserving perishable products. 3,673,758, Cl. 53-22.00b.

Etablissement Radiator: *See*—
Jonsson, Finn Lennart; Trolle, Stern; and von Platen, Baltzar Carl, 3,674,403.

Ethyl Corporation: *See*—
Brendel, Gottfried J., 3,674,846.
Schell, Raymond A.; and Kehoe, Lawrence J., 3,674,889.

Etimex Interplastic GmbH: *See*—
Welle, Dieter, 3,674,391.

Eutectic Corporation: *See*—
Joseph A. David, 3,674,471.

Evalahti, Osmo Rainer, to Osakeyhtio, A. Ahlstrom. Headbox for a paper machine providing for simultaneous adjustment of the front wall and mixing roll therein. 3,674,633, Cl. 162-342.

Evans, David J. I.; and Weir, Donald Robert, to Sherritt Gordon Mines Limited. Recovery of nickel from nicbel ammonium carbonate systems. 3,674,465, Cl. 75-108.000.

Evans, David T., to Wells Manufacturing Corporation. Band saw blade cleaning means. 3,673,903, Cl. 83-168.000.

Evans, Delme, to Lilly Industries, Ltd. Anti-inflammatory method. 3,674,871, Cl. 424-270.000.

Evans, Wallace D., Jr., to Rolatape Corporation. Measuring wheel apparatus. 3,673,693, Cl. 33-141.00r.

Everett, Rollo J.: *See*—
Meyer, Gilbert R.; and Everett, Rollo J., 3,674,555.

Evesque, Roger A., to Seaquist Valve Company; division of and Pittway Corporation. Aerosol valve with filling means. 3,674,185, Cl. 222-402.160.

Evironment/One Corporation: *See*—
Van Luik, Frank W.; and Coffey, Peter E., 3,674,435.

Ewald, Ronald F. Self-aligning aerosol overcap and button. 3,674,184, Cl. 222-402.130.

Ewald, Ronald F., to Seaquist Valve Company; divison of and Pittway Corporation. Co-dispensing valve. 3,674,186, Cl. 222-402.210.

Eydieux, Marius, to Regie Nationale des Usines Renault. Milling cutters with detachable blades. 3,673,655, Cl. 29-105.000.

Ezekiev, Ezekiya Gueorguiev: *See*—
Tsvetkov, Krum Kostov; Ezekiev, Ezekiya Gueorguiev; Nikolov, Petko Petrov; and Otsetov, Vassil Christov, 3,674,991.

Fabre, Albert, to Rhone-Poulenc S.A. Tubular and porous fibres. 3,674,628, Cl. 161-178.000.

Facquet, Louis: *See*—
de Vaulchier Du Deschaux, Louis; de Fouchier, Alain; de Vaucelles, Emmanuel; and Facquet, Louis, 3,674,655.

Fagersta Bruks AB: *See*—
Hallstrom, Ingemar Gustaf Terje; Jarleborg, Martin Holger; and Tarnblom, Stig-Goran Harry, 3,674,570.

Fagersta Bruks Aktiebolag: *See*—
Gustafson, Manfred Wallace; and Sandrud, Torsten, 3,673,657.
Loqvist, Kaj R., 3,673,677.

Fahlbush, Hans Joachim, to Schmalbach-Lubeca-Werke Aktiengesellschaft. Fully opening cover of sheet metal for cans. 3,674,171, Cl. 220-54.000.

Fahr Bucher GmbH Gottmadingen: *See*—
Sauerbruch, Ernst; Scherrer, Donat; and Vogt, Willy, 3,674,400.

Fahrbach, Kurt Erich, to Siemens Aktiengesellschaft. Arrangement for establishing the speed of flow of blood. 3,675,192, Cl. 340-3.00d.

Fairfield, Louis R., Jr.; Van Vliet, Raymond A.; and McLauchlan, Thomas A., to Weyerhaeuser Company. Saw guides. 3,674,065, Cl. 143-160.00r.

Falay, Bernard: *See*—
Froumajou, Armand; and Falay, Bernard, 3,673,882.

Falenks, John, to Diversified Medical Corporation. Apparatus for automatic inflation of cavities of the body. 3,674,010, Cl. 128-2.00r.

Fang, Frank F.; and Lean, Eric G., to International Business Machines Corporation. Acoustic wave amplifier having a coupled semiconductor layer. 3,675,140, Cl. 330-5.500.

Faragasso, Frank. Sprinkler housing. 3,674,210, Cl. 239-204.000.

Faraghan, Joseph T. Variable speed drive. 3,673,880, Cl. 74-197.000.

Farbenfabriken Bayer Aktiengesellschaft: *See*—
Arlt, Dieter, 3,674,829.
Baumgartner, Siegfried; Kindler, Hubert; Lidl, Rolf; and Boden, Henrich, 3,674,398.
Boehmke, Gunther, 3,674,835.
Schnegg, Robert; Pelousek, Herbert; Dippolhofer, Robert; Wiegreffe, Wolfgang; Voelz, Hans-Georg; and Kienast, Gerhard, 3,674,747.
Siegel, Edgar, 3,674,771.

Vernaleken, Hugo; Court, Otto; and Weirauch, Kurt, 3,674,740.
Wirth, Wolf-Dieter; and Muller, Erwin, 3,674,837.

Farbwerke Hoechst Aktiengesellschaft vormals Lucius & Bruning: *See—*
Oberst, Hermann; Ebigt, Joachim; Duve, Gunther; and Schommer, Alfred, 3,674,625.

Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning: *See—*
Lindner, Fritz; Wallhausser, Karl Heinz; and Huber, Gerhard, 3,674,866.
Oberst, Hermann; Ebigt, Joachim; Duve, Gunther; and Schommer, Alfred, 3,674,624.
Scherer, Otto; and Stahler, Gerhard, 3,674,803.
Schinzel, Erich; Pintschovius, Ulrich; and Lebkucher, Karl Heinz, 3,674,781.
Stache, Ulrich; Radscheit, Kurt; Fritsch, Werner; Haede, Werner; and Lindner, Ernst, 3,674,779.

Farha, Floyd E., Jr.: *See—*
Box, E. O., Jr.; Drehman, Lewis E.; and Farha, Floyd E., Jr., 3,674,706.

Farhi, Edward H.: *See—*
Farhi, Raphael; and Farhi, Edward H., 3,673,731.

Farhi, Raphael; and Farhi, Edward H. Reversible aerodynamic disc and gyroscopic toy. 3,673,731, Cl. 46-47.000.

Farnand, Joseph Redmond; and Puddington, Ira Edwin, to Canadian Patents and Development Limited. Hollow spherical articles. 3,674,461, Cl. 75-.50r.

Faroudja, Yves C., to Data Memory, Inc. Time base correction system for video recording apparatus. 3,674,920, Cl. 178-5.4cd.

Farrar, Ralph C.: *See—*
Gaeth, Rudolf H.; and Farrar, Ralph C., 3,674,895.

Farwer, Alfward: *See—*
Becker, Werner; Farwer, Alfward; Frank, Georg; Reis, Bernhard; Rohf, Josef; and Auer, Rupert, 3,674,978.

Fasnacht, James J.: *See—*
Vanderbilt, Byron M.; and Fasnacht, James J., 3,674,542.

Fastener Corporation: *See—*
Doyle, Richard H., 3,673,922.

Fathauer, George H., to Hill, Harold, Jr., mesne. Impedance measuring circuit including means for automatically adjusting initial condition thereof. 3,675,120, Cl. 324-61.00r.

Fazio, James A.; and Wesbey, William H., to General Electric Company. Dark current clamp for television camera with a circular field of view permitting maximum utilization of vidicon target. 3,674,931, Cl. 178-7.1.

Federal Sign and Signal Corporation: *See—*
Wasson, Richard Z., 3,674,226.

Federal-Mogul Corporation: *See—*
Ladin, Eli M.; Kegerise, Harry L.; and Adams, John S., 3,674,357.
Secunda, Kenneth, 3,673,661.

Fedewitz, Anthony. High-lift snow shoe. 3,673,713, Cl. 36-2.5ab.

Fedorov, Svyatoslav Nikolaevich; and Zakharov, Valery Dmitrievich. Artificial anteria chamber lens. 3,673,616, Cl. 3-13.000.

Feeney, Brian P.: *See—*
Peters, Joseph, Jr.; and Feeney, Brian P., 3,674,909.

Fegley, Charles R.: *See—*
Abraham, Bruce C.; Fegley, Charles R.; and Lougher, George B., III, 3,674,141.

Feichtinger, Hans: *See—*
Gothel, Herbert; and Feichtinger, Hans, 3,674,692.

Feichtmayr, Franz: *See—*
Wuerstlin, Franz; and Feichtmayr, Franz, 3,674,695.

Fekete, Frank; and McNally, John S. Unsaturated polyesters. 3,674,727, Cl. 260-22.00d.

Feldman, Martin; and Heiter, George Ludwig, to Bell Telephone Laboratories, Incorporated. Electromagnetically sensitive device and charge storage method of operation. 3,675,025, Cl. 250-211.00j.

Fendal Company: *See—*
Liautaud, Philip J., 3,673,610.

Ferguson, Hugo S., to Reel Vortex, Inc. Cross-flow mowing machine. 3,673,773, Cl. 56-13.300.

Fernex, Michel: *See—*
Rheiner, Alfred, Jr.; Fernex, Michel; and Herrero, Jose, 3,674,872.

Fernseh GmbH: *See—*
Flasche, Gunter, 3,675,062.
Legler, Ernst, 3,674,918.

Ferro Manufacturing Corporation: *See—*
Pickles, Joseph; and Fudala, Chester S., 3,674,238.

Ferro Manufacturing Crporation: *See—*
Pickles, Joseph, 3,673,891.

Fichtner, Roland H., to Electrohome Limited. Transistor power amplifier with DC output voltage stabilization. 3,675,142, Cl. 330-17.000.

Fifth Dimension Inc.: *See—*
Bitko, Sheldon S., 3,674,976.

Figge, Erwin E.; and Ho, Edward J., to Bell & Howell Company. Photographic system for step-motion projector. 3,674,348, Cl. 352-84.000.

Fikse, Tyman H., to Tyee Construction Company. Crane with telescopic boom. 3,674,157, Cl. 212-55.000.

Filachek, Lawrence A.; and Rakow, Marvin S., to Cities Service Oil Company. Antistatic additive for hydrocarbon fuels. 3,674,450, Cl. 44-66.000.

File, Harold Thomas, to Aspro-Nicholas Limited. Article sensing apparatus. 3,674,140, Cl. 209-73.000.

Filia, George J., to Sargent & Company. Work locator with insulation adjustment for crimping tool. 3,673,848, Cl. 72-410.000.

Fine, Max M. Liquid purifying system. 3,674,650, Cl. 202-176.000.

Finsterwalder, Klemens: *See—*
Finsterwalder, Ulrich; Finsterwalder, Klemens; and Stefaniak, Hans, 3,673,624.

Finsterwalder, Ulrich; Finsterwalder, Klemens; and Stefaniak, Hans, to Dyckerhoff & Widmann. Suspension bridge. 3,673,624, Cl. 14-19.000.

Firestone Tire & Rubber Company, The: *See—*
Halasa, Adel F., 3,674,760.
Thacker, Bernard L., Jr., 3,673,648.

Firmenich Incorporated: *See—*
Honey, Raymond; and Perkins, James Frank, 3,674,502.

Fisch, Willy: *See—*
Lohse, Friedrich; Schmid, Rolf; Fisch, Willy; and Batzer, Hans, 3,674,746.

Fischer, Richard, to Braun Aktiengesellschaft. Shearing head for dry shaver. 3,673,683, Cl. 30-34.100.

Fischer, Robert E.; Raiff, Lawrence C.; Seybold, James M.; and Zimmerle, Donald F., to National Cash Register Company, The. Document scanning and display system. 3,674,924, Cl. 178-6.800.

Fisher, Charles H. Methods for preparing valuable keto and hydroxy cyclic compounds. 3,674,880, Cl. 260-621.00r.

Fisher, Myron W.; and Hanessian, Stephen, to Parke, Davis & Company. Polyvalent immunizing agents and methods for their production. 3,674,863, Cl. 424-92.000.

Fitton, Peter; and Rick, Edward A., to Union Carbide Corporation. Halo(aryl)metal compounds and method of preparation. 3,674,825, Cl. 260-429.00r.

Flaherty, John J.; and Nerwin, Henry N., to Magnaflux Corporation. Non-destructive testing system having pattern recognition means. 3,673,860, Cl. 73-67.900.

Flasche, Gunter, to Fernseh GmbH. Method and apparatus for connecting to a Nesa layer. 3,675,062, Cl. 313-65.000.

Fleischmajer, Raul. Disposable wet compresses. 3,674,027, Cl. 128-268.000.

Fleissner, Heinz, to Vepa AG. Apparatus for the continuous finishing of knitted fabrics and hosiery goods. 3,673,822, Cl. 68-5.000.

Fletcher, Clive R., to Bakelite Xylonite Limited. Livestock container. 3,673,987, Cl. 119-19.000.

Flight Refuelling Limited: *See—*
Macgregor, Peter Stevens, 3,674,049.

Fluck, Eugene R.: *See—*
Bluhm, Herbert J.; and Fluck, Eugene R., 3,674,806.

Fluhr, Nils Allan, to Knut Arne Erik Rehnstrom. Seal. 3,673,927, Cl. 92-98.000.

Fogelman, Edward I., to Diamond Shamrock Corporation. Expandable electrodes. 3,674,676, Cl. 204-286.000.

Fogiel, Adolf Wojciech: *See—*
Aufdermarsh, Carl Albert, Jr.; and Fogiel, Adolf Wojciech, 3,674,721.

Fontaine, John Garfield. Captive air brake for vehicles. 3,674,321, Cl. 303-28.000.

Foote, J. B., Foundry Co., The: *See—*
Hauser, Hans, 3,673,889.

Forbro Design Corporation: *See—*
Nercessian, Sarkis, 3,675,114.

Ford, Duane B.: *See—*
Young, Bruce O.; Walker, Grant W.; Ford, Duane B.; and Seegmiller, Wan, 3,674,115.

Ford Motor Company: *See—*
Jackson, Paul Louis, 3,674,654.

Formisano, Mario; and Coppola, Salvatore, to I.C.B.S.P.A. Industria Chimica e Biologica. Method for the production of humic acids, humates, and of compositions wherein they are contained. 3,674,649, Cl. 195-104.000.

Forrer, Homer W., to Mead Corporation, The. Carrier for flanged articles. 3,674,136, Cl. 206-655.000.

Fortune, William S. Smoking habit-breaking aid apparatus. 3,674,037, Cl. 131-198.00a.

Foster, Alden W. Method of transporting oil or gas in frozen tundra. 3,674,086, Cl. 165-1.000.

Foster, Richard N.; and Butt, John B., said Butt assor. to said Foster. Enhancing reaction rates. 3,674,666, Cl. 204-164.000.

Fowler, Stanley B., to General Motors Corporation. Vehicle seat latch. 3,674,309, Cl. 297-379.000.

Fox, Homer M.: *See—*
Bjornson, Geir; and Fox, Homer M., 3,674,668.

Francini, Joseph Pirra; Braxton, James Lopez, Jr.; Lewis, Vera Gloria; McPherson, Frank Henderson; Rosenberg, Daniel; and Sekse, Torkjell, to Sperry Rand Corporation. Machine to read information from punched cards for the purpose of data processing said information and for the purpose of sorting, collating and merging said punched cards in accordance with said processed information. 3,674,988, Cl. 235-61.7.

Frank, Georg: *See—*
Becker, Werner; Farwer, Aifward; Frank, Georg; Reis, Bernhard; Rohf, Josef; and Auer, Rupert, 3,674,978.

Frankeny, Richard F.; and Tuttle, Joey K., to International Business Machines Corporation. Apparatus and method independently varying the widths of a plurality of pulses. 3,675,133, Cl. 328-55.000.

Franz, John E., to Monsanto Company. 2-Acyl-4-acyloxy-2,3,4,5-tetrahydro-1,2,4ooxadiazoles. 3,674,802, Cl. 260-307.00f.
Fraser, G. Frank, to Chevron Research Company. Portable lighter for firing oil field heaters and emulsion treaters. 3,674,413, Cl. 431-344.000.
Fratelli Morando & C. S.p.A.: *See*—
Bronzine, Bruno, 3,673,898.
Freborg, Lehner C.: *See*—
Elliott, Eugene R.; and Freborg, Lehner C., 3,675,041.
Frebraro, James. Carpet tack strip. 3,673,633, Cl. 16-16.000.
Freedman and Goodman: *See*—
Grosberg, Sam, 3,674,266.
Freel, John: *See*—
Pieters, William Johan Meindert; Freel, John; and Anderson, Robert Bernard, 3,674,707.
Freeland, Iris Mary: *See*—
Freeland, William, 3,674,151.
Freeland, William; deceased (by Freeland, Iris Mary; executrix), to U.S. Philips Corporation. Backflushing filter. 3,674,151, Cl. 210-298.000.
Freeman, Darrell L., to Nutter Engineering Company; division of Heat/Fluid Engineering Corporation. Clamp assembly. 3,674,246, Cl. 261-114.00r.
Freeman, Peter Frank Hilary, to Imperial Chemical Industries Limited. Pesticidally active compounds and compositions containing them. 3,674,877, Cl. 424-263.000.
Freis, John H. Culture collecting apparatus. 3,674,007, Cl. 128-2.000.
French, Allen D.: *See*—
Bakeman, Orville R.; and French, Allen D., 3,675,153.
French, John M.: *See*—
Hill, Robert C.; French, John M.; and Toepfer, Richard E., 3,675,019.
Frey, Hans-Hasso; and Liisberg, Sven, to Lovens Kemiske Fabrik Produktionsaktieselskab. 2-(Morpholinobenzyl)-anilides. 3,674,787, Cl. 260-247.20a.
Fried, John H.: *See*—
Edwards, John A.; Fried, John H.; and McCrae, William, 3,674,816.
Friel, Ronald Norman: *See*—
Castellano, Joseph Anthony; and Friel, Ronald Norman, 3,674,342.
Fries, Bernd: *See*—
Baumgartner, Siegfried; Fries, Bernd; Lidl, Rolf; and Zippe, Gunter, 3,674,408.
Frietzsche, Angelika: *See*—
Richter, Gerhard; Kroes, Magdalena; and Frietzsche, Angelika, 3,674,710.
Fritsch, Werner: *See*—
Stache, Ulrich; Radscheit, Kurt; Fritsch, Werner; Haede, Werner; and Lindner, Ernst, 3,674,779.
Fritts, Russell A.; and Nebold, Jerome I., to Black and Decker Manufacturing Company, The. Pressurized fluid device. 3,673,921, Cl. 91-299.000.
Froumajou, Armand; and Falay, Bernard, to Automobiles Peugeot and Regie Nationale des Usines Renault. Engine-drive unit having a converter and speed variator. 3,673,882, Cl. 74-199.000.
Fryatt, Leslie Alva: *See*—
Cooper, Michael Henry; and Fryatt, Leslie Alva, 3,673,904.
Fudala, Chester S.: *See*—
Pickles, Joseph; and Fudala, Chester S., 3,674,238.
Fuji Denki Kagaku Kabushiki Kaisha: *See*—
Kobayashi, Seihin; Torii, Michihiro; and Yamakawa, Fujio, 3,675,222.
Kobayashi, Seihin; Torii, Michihiro; and Suzuki, Koichiro, 3,675,223.
Tsuchida, Takashi; Hayase, Yoshiaki; and Fujisawa, Yoshirou, 3,674,561.
Fuji Photo Film Co., Ltd.: *See*—
Iijima, Yoo; Shimamura, Isao; Kondo, Tokiharu; and Haruhike, Iwano, 3,674,491.
Tamai, Yasuo; and Miyazuka, Hajime, 3,674,476.
Fuji Photo Film, Ltd.: *See*—
Shiba, Keisuke; Hinata, Masanao; Tsuji, Nobuo; and Sato, Akira, 3,674,499.
Fujii, Tatsuo: *See*—
Tsukamoto, Masaaki; Fujii, Tatsuo; and Ono, Shigeo, 3,675,179.
Fujimori, Akihiro: *See*—
Washimi, Koichi; Kanbayashi, Masaaki; Kanai, Toshio; and Fujimori, Akihiro, 3,674,679.
Fujisawa, Yoshirou: *See*—
Tsuchida, Takashi; Hayase, Yoshiaki; and Fujisawa, Yoshirou, 3,674,561.
Fujitsu Limited: *See*—
Ninomiya, Shoichi; Sakai, Masaaki; Oka, Sakae; and Kusunoki, Kikunobu, 3,675,224.
Fujiwara, Takashi: *See*—
Hayakawa, Shohei; Kanematsu, Yoshiko; and Fujiwara, Takashi, 3,674,842.
Fujiwara, Yuzo: *See*—
Moritani, Ichiro; and Fujiwara, Yuzo, 3,674,884.
Fukasawa, Noburu; and Hatori, Yukiyoshi, to Nissan Motor Company, Limited. Liquid-level drop alarming system. 3,675,227, Cl. 340-244.00r.
Fukuba, Hiroshi. Carpet sweeper auxiliary brush means. 3,673,625, Cl. 15-42.000.
Fukuda, Satoshi: *See*—
Tachikawa, Kyoji; Tanaka, Yoshiaki; and Fukuda, Satoshi, 3,674,553.
Fukuoka, Yohei: *See*—
Senoo, Saburo; Fukuoka, Yohei; and Sasaki, Katuyoshi, 3,674,851.
Furukawa, Yauhiro: *See*—
Komatsu, Youji,; Furukawa, Yauhiro; and Yokomizo, Takashi, 3,674,886.
Fuzesi, Stephen; and Lapkin, Milton, to Olin Corporation. Open-cell polyurethane foams prepared from oxyethylated starch-phosphorus-containing polyethers. 3,674,717, Cl. 260-2.5as.
Gabbert, Ira: *See*—
Ellis, David R.; Michels, John; and Gabbert, Ira, 3,675,214.
Gacesa, Gerald R.: *See*—
Erikson, J. Alden; and Gacesa, Gerald R., 3,674,670.
Gaeth, Rudolf H.; and Farrar, Ralph C., to Phillips Petroleum Company. Polymerization of 1-olefins with multifunctional initiator systems. 3,674,895, Cl. 260-878.00b.
Gagarine, Dmitry M., to Deering Milliken Research Corporation. Process for imparting soil-releasing and anti-soil redeposition properties to textile materials. 3,674,548, Cl. 117-139.50a.
Gage, Frank H.; and Zabel, Marvin L., to Dyna-Jet Corporation, The. Washing apparatus. 3,674,211, Cl. 239-247.000.
Gaines, Albert L.: *See*—
Anthony, Andrew J.; Gaines, Albert L.; and Krawiec, Donald M., 3,674,635.
Gaiser, Conrad J. Detergent tablet of amorphous sodium silicate having inherent binding properties, containing a surfactant, and method of making such tablet. 3,674,700, Cl. 252-135.000.
Gakhar, Ved P., to General Electric Company. Dual load automatic washer. 3,673,823, Cl. 68-12.00r.
Gallien, Jacqueline: *See*—
Kalopissis, Gregoire; Gascon, Jean; Gallien, Jacqueline; Bugaut, Andree; and Gaston-Breton, Hubert, 3,674,414.
Galloway Company: *See*—
Galloway, Edwin J., 3,674,179.
Galloway, Edwin J., to Galloway Company. Telescoping dip tube assembly. 3,674,179, Cl. 222-94.000.
Gandrud, William Bentley: *See*—
Boyd, Gary Delane; Buehler, Ernest; and Gandrud, William Bentley, 3,675,039.
Garavelli, Giancarlo, to Heron Establishment. Device for making aerated soft drinks. 3,674,244, Cl. 261-18.00b.
Garlick, George F., to Holosonics, Inc., mesne. Geological mechanical computer. 3,673,688, Cl. 33-1.000.
Garlinghouse Brothers Manufacturing Co.: *See*—
Dening, Robert D.; and Garlinghouse, Leslie H., 3,673,931.
Garlinghouse, Leslie H.: *See*—
Dening, Robert D.; and Garlinghouse, Leslie H., 3,673,931.
Garrett Corporation, The: *See*—
Summer, James R., 3,674,124.
Garrett, Donald E.; and Zaloudek, Theodore V., to General Electric Company. Disabling circuitry, for automatic frequency hue control. 3,674,919, Cl. 178-5.40r.
Gascon, Jean: *See*—
Kalopissis, Gregoire; Gascon, Jean; Gallien, Jacqueline; Bugaut, Andree; and Gaston-Breton, Hubert, 3,674,414.
Gasser, Francois W.; and Girard, Pierre L., to Manufacture des Montres Rolex S.A. One-hour incremental watch setting device. 3,673,790, Cl. 58-63.000.
Gassner, Hans, to Kugelfischer George Schafer & Co. Method of machining a friction roller. 3,673,897, Cl. 82-1.00c.
Gaston-Breton, Hubert: *See*—
Kalopissis, Gregoire; Gascon, Jean; Gallien, Jacqueline; Bugaut, Andree; and Gaston-Breton, Hubert, 3,674,414.
Gaudry, Edouard: *See*—
Gaudry, Paul E.; Gaudry, Edouard; Descarries, Raymond; and Anderson, James, 3,673,628.
Gaudry, Paul E.; Gaudry, Edouard; Descarries, Raymond; and Anderson, James, to Consolidated Foods Corporation, mesne. Articulated handle and shampoo tank for a floor care machine. 3,673,628, Cl. 15-143.00a.
Gazuit, Georges, to NRM Corporation. Tire building drum. 3,674,604, Cl. 156-415.000.
Gebruder Junghans G.m.b.H.: *See*—
Scholz, Gunther, 3,673,792.
Gehl, Gerry J. W., Jr. Folding Christmas tree type of display stand. 3,674,612, Cl. 161-23.000.
Geib, Thomas E., to Weyerhaeuser Company. Abhesive pattern detector system. 3,675,015, Cl. 250-71.00r.
Geigy Chemical Corporation: *See*—
Troxler, Eduard; and Hausermann, Heinrich, 3,674,714.
Zergenyi, Janos; and Habicht, Ernst, 3,674,810.
Gencarelli, Richard A.: *See*—
Amidon, Roger W.; and Gencarelli, Richard A., 3,674,824.
General Applied Science Laboratories, Inc.: *See*—
Abele, Manlio G., 3,675,128.
General Electric Company: *See*—
Bakeman, Orville R.; and French, Allen D., 3,675,153.
Barkan, Philip, 3,674,964.

Barnett, Richard C.; Dark, Joe W.; and Schulze, James L., Sr., 3,674,005.
Beddows, Norman A.; Quigley, John A.; and Wielt, Warren P., 3,675,058.
Crowe, William P., 3,674,359.
Dounoucos, Angelo, 3,674,022.
Dutton, John C., 3,675,175.
Earing, Mason H., 3,675,081.
Fazio, James A.; and Wesbey, William H., 3,674,931.
Gakhar, Ved P., 3,673,823.
Garrett, Donald E.; and Zaloudek, Theodore V., 3,674,919.
Goossens, John C., 3,674,739.
Hurko, Bohdan; and Dills, Raymond L., 3,674,983.
Jordan, Thomas M., Jr., 3,674,927.
Kelley, Fred W., Jr., 3,675,110.
Kelling, Leroy U. C., 3,674,999.
Kelly, Jack L.; and Wiandt, Ronald K., 3,674,277.
Krebs, James Norton; and Kappus, Peter G., 3,673,802.
Lenz, Henry George, 3,675,056.
Mioduski, George T., 3,675,051.
Mullaly, Jerome R., 3,675,045.
Strout, Frederick D., 3,675,232.
Titus, Charles H.; and Schneider, Harold N., 3,674,912.

General Electric Company Limited, The: *See—*
Wayman, Cecil John, 3,675,235.

General Kinetics Incorporated: *See—*
Whysong, Dale C.; Leininger, Dale E.; and Young, Herbert D., 3,674,559.

General Mills, Inc.: *See—*
Schilling, Eugene D.; and Burchill, Phyllis I., 3,674,506.

General Motors Corporation: *See—*
Ackerman, Tracy R.; and Schickler, John F., 3,674,087.
Bennett, Ronald W.; Parker, Donald L.; and Shaw, Arthur R., 3,675,197.
Bradley, Thompson G.; and Swinkels, Dominicus A. J., 3,674,567.
Christman, Charles P., 3,675,187.
Cole, Edward N., 3,674,441.
Copeland, Charles R., 3,674,121.
Elliott, James O., 3,675,103.
Fowler, Stanley B., 3,674,309.
Jellison, Frank R.; Mason, John B.; and McQueen, Terry K., 3,674,283.
Johnson, Ralph S., 3,674,120.
Johnston, Richard W., 3,675,099.
Klimisch, Richard L., 3,674,423.
Kuehl, Paul B., 3,673,798.
Pryjmak, Bohdan I., 3,675,106.
Robbins, Samuel B., 3,675,101.
Rohde, Robert P.; Welsh, Clarence E.; and Engelhardt, Hans, 3,674,385.
Staker, William C., 3,675,160.
Wanlass, Bert R.; and Velavicius, Alfonsas, 3,674,296.

General Signal Corporation: *See—*
Auer, John H., Jr.; and Huffman, Jerry P., 3,675,190.

General Tire & Rubber Company, The: *See—*
Dailey, Charles R., Jr., 3,674,076.

Ger-Bro Corporation: *See—*
Geraci, Francis R., 3,674,289.

Geraci, Francis R., to Ger-Bro Corporation. Tri-hedral clip for steel construction. 3,674,289, Cl. 287-189.36b.

Gerbstadt, Frederick H.: *See—*
Trost, Joseph C.; Bock, Robert V.; Gerbstadt, Frederick H.; Graham, William J.; Miles, Wilson D.; and Questa, Charles R., 3,675,209.

Gerchow, Wilbur R., to Buhr Machine Tool Corporation, mesne. Plunge facing tool. 3,673,656, Cl. 29-105.00a.

Gerding, Charles C.: *See—*
Stawarski, Chester C.; Gerding, Charles C.; and Adams, Richard T., 3,673,869.

Gerlach, Glendon T.: *See—*
Stone, J. James, Jr.; Madden, Thomas J., Jr.; Gerlach, Glendon T.; and Keur, Robert I., 3,673,936.

Gerns, Fred R.: *See—*
Thomas, Robert M.; Gerns, Fred R.; and Sands, John L., 3,674,788.

Gerrard, A. J., & Company: *See—*
Koehler, Albert T.; Shideler, Paul J.; and Dohogne, Linus E., 3,673,950.

Gesellschaft zur Wiederaufarbeitung von Kernbrennstoffen m.b.H.: *See—*
Gutter, Heinrich, 3,674,196.

Geul, Herman R. Exhaust gas analyzer for internal combustion engines. 3,674,436, Cl. 23-232.00e.

Giannini, Mary Suzanne: *See—*
Aszalos, Adorjan; Robison, Robert S.; Kraemer, Nancy; Henshaw, Jo Ann; and Giannini, Mary Suzanne, 3,674,867.

Giardini, Dante S., to Bendix Corporation, The. Arrangement for internal form grinding portions of spherical surfaces. 3,673,739, Cl. 51-73.00r.

Giardini, Dante S.; and Szempruch, Robert S., to Bendix Corporation, The. Grinding method and apparatus. 3,673,740, Cl. 51-95.0wh.

Giardini, Dante S.; and Wieg, Heinrich J., to Bendix Corporation, The. Machine assembly. 3,673,743, Cl. 51-168.000.

Gibbons, Carl L., to Dow Chemical Company, The. Halogenated epoxides. 3,674,812, Cl. 260-348.00r.

Gibian, Heinz: *See—*
Philippson, Rainer; Hauser, Helmut; Gibian, Heinz; Kaspar, Emanuel; and Kessler, Hans-Joachim, 3,674,815.

Gifft, T. H., Co., Inc.: *See—*
Gifft, Thomas H., 3,674,923.

Gifft, Thomas H., to Gifft, T. H., Co., Inc. Facsimile system with improved scanning. 3,674,923, Cl. 178-6.60r.

Gilbert, Leslie Arthur, to Ray and Gilbert Proprietary Limited. Drafting machine. 3,673,691, Cl. 33-79.00r.

Gilbert, Ronald E.: *See—*
Anspon, Harry D.; Clampitt, Bert H.; and Gilbert, Ronald E., 3,674,761.

Gile, Richard H., to Richardson, Howe Scale Company. Motion detector for weighing apparatus. 3,674,097, Cl. 177-3.000.

Gillick, Jack W., to Park-Ohio Industries, Inc. Apparatus and method of inductively heating and quench hardening an elongated workpiece. 3,674,247, Cl. 266-4.00e.

Gilmour Manufacturing Company; division of: *See—*
Gilmour, Robert A., 3,674,138.

Gilmour, Robert A., to Gilmour Manufacturing Company; division of and Smith, R. M., Inc. Carded nozzle package. 3,674,138, Cl. 206-80.00r.

Giltrow, Jeremy Peter; Kinner, George Henry; and Lancaster, John Keith, to National Research Development Corporation. Carbon fibre filled composite materials. 3,674,689, Cl. 252-12.400.

Ginter, Thomas O.: *See—*
Nowak, Robert M.; and Ginter, Thomas O., 3,674,893.

Giolito, Silvio Louis, to Stauffer Chemical Company. Styrenated triaryl phosphate functional fluids. 3,674,697, Cl. 252-78.000.

Giolitti, Nicolo, to Olivetti, Ing., C., & C., S.p.A. Numerical data transfer device. 3,674,201, Cl. 235-61.0pc.

Giolitti, Nicolo; and Daly, Dante, to Olivetti, Ing., C., & C., S.p.A. Calculating machine. 3,674,202, Cl. 235-61.0pb.

Girard, Pierre L.: *See—*
Gasser, Francois W.; and Girard, Pierre L., 3,673,790.

Giuffre, Joseph C.: *See—*
Heilmayr, Peter F.; Kimbrell, Sol B.; and Giuffre, Joseph C., 3,674,388.

G.K.N. Screws & Fasteners Limited: *See—*
Turnbull John Hilton, 3,673,662.

Glaser, David. Crystal ball display system having touch controlled lights. 3,675,241, Cl. 340-366.

Glaser, Hermann: *See—*
Vogt, Wilhelm; Sennewald, Kurt; and Glaser, Hermann, 3,674,839.

Glass, Waldemar: *See—*
Kunke, Arthur; Reinhardt, Dieter; and Glass, Waldemar, 3,675,023.

Glastrusions, Inc.: *See—*
Goldsworthy, William Brandt, 3,674,601.

Glaverbel S.A.: *See—*
Plumat, Emile; and Toussaint, Francois, 3,674,454.

Glaze, Stanley George, to Hobson, H. M., Limited. Pressure ratio sensing. 3,675,225, Cl. 340-196.000.

Gleason, Thomas G., to Combustion Equipment Associates, Inc. Gas scrubber. 3,673,769, Cl. 55-223.000.

Gleason Works, The: *See—*
Pedersen, Harry, 3,674,280.

Globe Tool and Engineering Company, The: *See—*
Biddison, John M., 3,673,878.

Globus, Anatol; Duplex, Paul; and Vautier, Roger, to Agence Nationale de Valorisation de la Recherche (Anvar). Process and mill for grinding pulverulent materials, and the materials thus ground. 3,674,218, Cl. 241-46.060.

Glosten, Lawrence R. Convertible-float floating platform. 3,673,973, Cl. 114-.50d.

Gmunder, John: *See—*
Bormann, Gerhard; Gmunder, John; Wilkens, Heinrich; and Troxler, Franz, 3,674,801.

Goetz, Frederick J.: *See—*
Degginger, Edward R.; and Goetz, Frederick J., 3,674,878.

Goings, Harford E. Refuse and tissue holder. 3,674,191, Cl. 224-29.00r.

Goldberg, Herbert E., to American Optical Corporation. Assisted cardiovascular circulation. 3,674,018, Cl. 128-33.000.

Goldberg, Leonard. Parking field security device. 3,673,734, Cl. 49-35.000.

Goldberg, Leonard Z., to Lockheed Aircraft Corporation. Flange for conduit coupling. 3,674,291, Cl. 285-367.000.

Goldberg, Marvin E.: *See—*
Schwarz, Milton H.; and Goldberg, Marvin E., 3,674,631.

Goldberger, Max, to Pioneer Research, Inc. Propulsion method using catalytic decomposition of hydrazine. 3,673,801, Cl. 60-218.000.

Goldrick, Michael Richard; Kerwin, Robert Eugene; and Skinner, John George, to Bell Telephone Laboratories, Incorporated. Laminar photomask. 3,674,492, Cl. 96-68.000.

Goldsmith, Alfred Norton, to RCA Corporation. Three-dimensional television system. 3,674,921, Cl. 178-5.40r.

Goldsworthy, William Brandt, to Glastrusions, Inc. Augmented curing of reinforced plastic stock. 3,674,601, Cl. 156-380.000.

Gollan, Arye, to Hydronautics Incorporated. Continuous fluid-solid contact method and apparatus. 3,674,684, Cl. 210-33.000.

Gomez, Ray J.; and Sawa, Kenneth B., to Beckman Instruments, Inc. Bypass filter assembly and method of obtaining a filtered sample. 3,674,153, Cl. 210-409.000.

Gonon, Eugen, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Apparatus for the production of continuous lengths of foamed polystyrene. 3,674,387, Cl. 425-4.000.

Gooding, Chester M., to CPC International Inc. Production of high stability liquid vegetable oils. 3,674,821, Cl. 260-409.000.

Gooding, Otis E.; and Dixon, Alton E., to United States of America, Navy, mesne. Minimum shift keyed (MSK) phase measurement device. 3,674,934, Cl. 178-88.000.

Goodrich, B. F., Company, The: *See—*
Cameli, Nazzareno; Longi, Paolo; and Valvassori, Alberto, 3,674,754.

Goossens, John C., to General Electric Company. Organosilylamines reaction between organosilylamine and a silanol-containing organosilicon material. 3,674,739, Cl. 260-46.50g.

Gorbran, Ramsis; and Ofstead, Ronald F., to Minnesota Mining and Manufacturing Company. Photographic emulsions containing nonpolymeric amines. 3,674,497, Cl. 96-94.000.

Gordon, Paul C.: *See—*
Scarnato, Thomas J.; Gordon, Paul C.; Hunter, Stephen R.; Krage, Paul W.; and Zablocki, Richard A., 3,673,779.

Gordon, Peter L.: *See—*
Kunov, Hans, 3,673,979.

Gorecki, Thomas A.: *See—*
Loewenstein, Paul; and Gorecki, Thomas A., 3,673,667.

Gorling, Karl Goran, to Boliden Aktiebolag. Process for low temperature chlorination of roasted products from an iron sulphide roasting process prior to leaching out the non-ferrous metal present therein. 3,674,462, Cl. 75-9.000.

Gosney, William Milton: *See—*
Carbajal, Bernard G., III; Gosney, William Milton; and Hall, Lou H., 3,673,679.

Gostomski, Frank T. Cushioned support means. 3,674,104, Cl. 180-5.00r.

Gosudarstvenny Naucho-issledovatelsky Institut tsvetnykh metallov and Belgorodsky Kotlo-Stroitelny zavod: *See—*
Berlin, Zalman Leivikovich; Bagrov, Oleg Nikolaevich; Maslovsky, Gennady Vasilievich; Serkov, Anatoly Gavrilovich; and Yakimovich, Viktor Yakovlevich, 3,673,988.

Gotcher, Eugene D.: *See—*
Peisner, Israel D.; Stol, George H.; and Gotcher, Eugene D., 3,673,969.

Gothel, Herbert; and Feichtinger, Hans, to Ruhrchemie AG. Lubricants and power transmission fluids on the basis of carboxylic acid esters. 3,674,692, Cl. 252-56.00s.

Gottschall, Gernot, to Morat, Franz, G.m.b.H., Firma. Film-driving roller with device for stopping the drive mechanism if the film is broken. 3,674,192, Cl. 226-11.000.

Gould, Francis E.: *See—*
Shepherd, Thomas H.; and Gould, Francis E., 3,674,901.

Grace, W. R., & Co.: *See—*
Gray, Roland H., Jr., 3,674,556.
Gray, Roland H., Jr., 3,674,557.
Pieters, William Johan Meindert; Freel, John; and Anderson, Robert Bernard, 3,674,707.

Graf, Robert E.: *See—*
Deeg, Emil W.; and Graf, Robert E., 3,674,530.

Graham, William J.: *See—*
Trost, Joseph C.; Bock, Robert V.; Gerbstadt, Frederick H.; Graham, William J.; Miles, Wilson D.; and Questa, Charles R., 3,675,209.

Grammont, Paul D.: *See—*
Carbonnel, Jack V.; Grammont, Paul D.; and Werotte, Louis E., 3,674,728.

Grand-City Container Corporation: *See—*
Dorfmann, Oskar, 3,673,763.

Grandia, Johannes; and Rohr, Robert Lewis, to International Business Machines Corporation. Precision cutting apparatus and method of operation therefor. 3,674,004, Cl. 125-16.000.

Grandin, Friedrich-Hans: *See—*
Petersen, Ulrich; and Grandin, Friedrich-Hans, 3,673,836.

Grange, Kenneth H., to Maruzen Sewing Machine Co., Ltd. Sewing machine with combined accessory receptacle and auxiliary bed. 3,673,972, Cl. 112-258.000.

Grant Airmass Corporation: *See—*
Grant, Benton H., 3,674,019.

Grant, Benton H., to Grant Airmass Corporation. Dual layer cellular inflatable pad. 3,674,019, Cl. 128-33.000.

Grant, John M., to International Telephone and Telegraph Corporation. Image intensifier with electroluminescent phosphor. 3,675,028, Cl. 250-213.0vt.

Graser, Earl J., to Olinkraft, Inc. Neck thru safety lock. 3,674,137, Cl. 206-65.00e.

Grasshoff, J. Michael; and Taylor, Lloyd D., to Polaroid Corporation. Novel products and processes. 3,674,478, Cl. 96-3.000.

Graville, Brian Anthony, to Dominion Bridge Company Limited. Laydown electroslag welding process. 3,674,973, Cl. 219-73.000.

Gray Industries, Inc.: *See—*
Gray, Oscar S., 3,674,422.

Gray, Oscar S., to Gray Industries, Inc. Microwave treating apparatus. 3,674,422, Cl. 21-102.00r.

Gray, Roland H., Jr., to Grace, W. R., & Co. Method for drying glucose solutions. 3,674,556, Cl. 127-62.000.

Gray, Roland H., Jr., to Grace, W. R., & Co. Method for drying sugar solutions. 3,674,557, Cl. 127-62.000.

Great Lakes Chemical Corporation: *See—*
Thomas, Robert M.; Gerns, Fred R.; and Sands, John L., 3,674,788.

Greene, Richard M., to GTE Laboratories Incorporated. All-FET linear voltage amplifier. 3,675,143, Cl. 330-18.000.

Greening, Donald J.: *See—*
Allison, Arthur F.; Greening, Donald J.; and Mollgaard, Anton N., 3,675,104.

Gregory, David L., to Avco Corporation. Combination multiple wire termination block and wire stripper. 3,675,182, Cl. 339-98.000.

Gregory, George D.: *See—*
Snaper, Alvin A.; Gregory, George D.; and Munroe, Miles R., 3,675,220.

Griepentrog, Dal Frank, to RCA Corporation. Automatic beam current limiter. 3,674,932, Cl. 178007.50r.

Griesinger, William K.; Sorgenti, Harold A.; and Schell, George W., to Atlantic Richfield Company. Alkylation of benzene utilizing Fischer-Tropsch olefin-paraffin mixtures. 3,674,885, Cl. 260-671.00b.

Griffiths, James Edward, to Bell Telephone Laboratories, Incorporated. Gaseous dielectric materials. 3,674,696, Cl. 252-63.700.

Grinde, Jon W., to King Company, Inc. Lift boom assembly. 3,674,161, Cl. 214-130.00r.

Griswold, Augustus W.; and Tompkins, James R., to Sybron Corporation. Gas content of liquid determination. 3,673,853, Cl. 73-19.000.

Groenenboom, Maarten: *See—*
Arts, Mathieu Gerardus Henricus; Lucker, Jan Anna Antonius; and Groenenboom, Maarten, 3,674,674.

Groenewald, Hans E.: *See—*
Konecny, Jan; Haas, Jan T.; and Groenewald, Hans E., 3,674,224.

Grosberg, Sam, to Freedman and Goodman. Double-ended ball paddle. 3,674,266, Cl. 273-73.00r.

Grosseau, Albert, to Citroen S.A. (Automobiles Citroen, Berliet, Panhard). Vehicle suspension. 3,674,285, Cl. 280-124.00r.

Grosseau, Albert, to Societe Anonyme Automobiles Citroen. Methods of coating surfaces and in elements comprising such surfaces. 3,674,544, Cl. 117-93.1pf.

Growald, Bert; Dahlquist, John A.; and Marlor, Guy A., to Varian Associates. Electrically conductive transparent plastic material. 3,674,711, Cl. 252-500.000.

Gruber, Lothar: *See—*
Korner, Gerhard; Schmitz, Wolfgang; Dabringhausen, Friedhelm; and Gruber, Lothar, 3,674,957.

Gruenig, Rudolf; Berger, Erwin; and Sieber, Charles, to Hasler A.G. Selector and setting device for the synchronous operation of at least two multi-denominational counters in a machine such as a cash register capable of effecting printing operations. 3,674,200, Cl. 235-60.00r.

GTE Laboratories Incorporated: *See—*
Greene, Richard M., 3,675,143.

GTE Sylvania Incorporated: *See—*
Chiola, Vincent; and Dodds, Phyllis R., 3,674,464.

Gualdi, Giorgio: *See—*
Reni, Cesare; Gualdi, Giorgio; and Lugo, Luigi, 3,674,845.

Gubler, Kurt: *See—*
Rutz, Hans; and Gubler, Kurt, 3,674,874.

Guerard, Albert S. Process for freeze drying with carbon dioxide. 3,673,698, Cl. 34-5.000.

Guest, Ashley W., to Plessey Handel und Investments A.G. Electrical demodulation systems. 3,675,139, Cl. 329-104.000.

Guetta, Guy Claude. Call-number monitors for telephones. 3,674,941, Cl. 179-90.0an.

Gukelberger, Werner: *See—*
Neuhauser, Hans; Benz, Helmut; and Gukelberger, Werner, 3,673,919.

Gulbrasen, Earl A.; Tallman, Richard L.; Andrew, Kenneth F.; and Buzalski, Bruce T., to Westinghouse Electric Corporation. Photoflash lamp and multiple flashlamp system. 3,675,004, Cl. 240-1.3.

Guldenpfenning, Rolf, to Reichhold-Albert-Chemie Aktiengesellschaft. Method for producing water-dilutable epoxy ester resins containing copolymers of vinyl and/or vinylidene compounds. 3,674,731, Cl. 260-23.0ep.

Gulf Oil Corporation: *See—*
Merriam, Marshall F., 3,675,042.

Gulf Research & Development Company: *See—*
Anspon, Harry D.; Clampitt, Bert H.; and Gilbert, Ronald E., 3,674,761.

Gurkov, Konstantin Stepanovich: *See—*
Kostylev, Alexandr Dmitrievich; Gurkov, Konstantin Stepanovich; Tkach, Khaim Berkovich; and Lipovetsky, Lazar Moiseevich, 3,674,099.

Gustafson, Manfred Wallace; and Sandrud, Torsten, to Fagersta Bruks Aktiebolag. Device for clamping a cutting insert to a seat of a toolholder body. 3,673,657, Cl. 29-105.000.

Gustav Neuhauser Prazisionswerkzeugfabik O.M.G.: *See—*
Neuhauser, Hans; Benz, Helmut; and Gukelberger, Werner, 3,673,919.

Gutowski, Chester L., to Heinz, H. J., Company. Apparatus for transferring can lids through a partition subject to a pressure differential. 3,674,160, Cl. 214-17.00b.

Gutter, Heinrich, to Gesellschaft zur Wiederaufarbeitung von Kernbrennstoffen m.b.H. Centrifugal mixing and extraction apparatus. 3,674,196, Cl. 233-4.000.

Guzak, John, Jr., to SCM Corporation. High speed printer including changeable code means. 3,673,957, Cl. 101-93.

H & H Equipment Company: *See*—
McGee, Donald J., 3,674,249.

Haarbye, Fredrik O.; and Murphy, Peter C., to Mallory, P. R., & Co., Inc. Electrical contact material. 3,674,446, Cl. 29-195.000.

Haas, Jan T.: *See*—
Konecny, Jan; Haas, Jan T.; and Groenewald, Hans E., 3,674,224.

Haberlin, Richard J., to Polaroid Corporation. Novel photographic products and processes. 3,674,482, Cl. 96-29.000.

Habicht, Ernst: *See*—
Zergenyi, Janos; and Habicht, Ernst, 3,674,810.

Haede, Werner: *See*—
Stache, Ulrich; Radscheit, Kurt; Fritsch, Werner; Haede, Werner; and Lindner, Ernst, 3,674,779.

Hagelbarger, David W.: *See*—
Anderson, Robert V.; and Hagelbarger, David W., 3,675,240.

Hagen, William Dobson, to Dominion Bridge Company Limited. Structural steel conveyor line. 3,673,658, Cl. 29-155.005.

Hagino, Takuo: *See*—
Tani, Isamu; Otsuka, Masatomi; Osaki, Yoshiyasu; and Hagino, Takuo, 3,674,646.

Hahn, Richard L.; Stone, Roland L.; Tarrant, James R.; and Hunt, Lee D., to United States of America, Atomic Energy Commission. Fast-closing valve system for cyclotrons. 3,675,072, Cl. 315-111.000.

Haines, Paul Gordon: *See*—
Yochum, Daniel William; Haines, Paul Gordon; and Popoff, Ivan C., 3,674,701.

Hakka, Leo E.; Bata, George L.; and Hazell, John E., to Union Carbide Canada Limited. Detection device for gas mixtures. 3,674,439, Cl. 23-254.00r.

Halasa, Adel F., to Firestone Tire & Rubber Company, The. Method of producing butadiene-styrene copolymer. 3,674,760, Cl. 260-83.700.

Hales, John H. Manual steaming apparatus. 3,673,827, Cl. 68-222.000.

Hales, Kenneth Calvert; and Scrine, Gerald Robin, to Shipowners Refrigerated Cargo Research Association. Liquid nitrogen refrigeration system. 3,673,810, Cl. 62-158.000.

Hall, Lou H.: *See*—
Carbajal, Bernard G., III; Gosney, William Milton; and Hall, Lou H., 3,673,679.

Hall, William Bernard: *See*—
Strater, Kurt; Hall, William Bernard; Mihalick, Eugene Michael; and Stever, William Charles, 3,673,983.

Hallstrom, Ingemar Gustaf Terje; Jarleborg, Martin Holger; and Tarnblom, Stig-Goran Harry, to Fagersta Bruks AB. High-strength low alloy ferritic steel small-gauge wire. 3,674,570, Cl. 148-12.000.

Halmbrecht, William L.: *See*—
Welker, Robert H.; and Halmbrecht, William L., 3,673,737.

Hamamoto, Hiroshi: *See*—
Kimura, Takashi; Majima, Azusa; Hamamoto, Hiroshi; and Awano, Yoji, 3,674,472.

Hamann, Omer F., to Stromberg Datagraphix, Inc. Optical system for superimposing images. 3,673,933, Cl. 95-1.100.

Hamano, Goro, to Matsushita Electric Industrial Co., Ltd. Right shifting system with data stored in polish stack form. 3,674,997, Cl. 235-159.000.

Hamburger Flugzeugbau GmbH: *See*—
Konecny, Jan; Haas, Jan T.; and Groenewald, Hans E., 3,674,224.

Hameister, Harold L.; and Baszczuk, Andrew R., to Remington Arms Company, Inc. Profile shaping machine for firearm recoil pads and butt plates. 3,674,451, Cl. 51-127.000.

Hamilton, Billy Harold, to Bell Telephone Laboratories, Incorporated. Technique for synchronous parallel operation of static inverters. 3,675,037, Cl. 307-51.000.

Hammell, Kemper Martel, to AMP Incorporated. Alpha-numeric display. 3,675,242, Cl. 340-381.000.

Hanberg, Sanford M.: *See*—
Betlejewski, Frank W.; and Hanberg, Sanford M., 3,674,948.

Hancock, Ronald David: *See*—
Allum, Keith George; and Hancock, Ronald David, 3,674,768.

Hands, Edward, to Raytheon Company. Acoustic impedance matching system. 3,674,945, Cl. 179-110.00a.

Handy, Richard L., to Iowa State University Research Foundation, Inc. Method and apparatus for in situ measurement of soil creep strength. 3,673,861, Cl. 73-101.000.

Hanessian, Stephen: *See*—
Fisher, Myron W.; and Hanessian, Stephen, 3,674,863.

Hanig, Siegfried; and Langer, Alfred, to Ilseder Hutte, Firma. Liner for tunnel wall. 3,673,806, Cl. 61-45.00r.

Hansen, Gerhard. Apparatus for producing, filling and closing plastic containers. 3,674,405, Cl. 425-308.000.

Hansen, John Wilfred: *See*—
Duguay, Michel Albert; and Hansen, John Wilfred, 3,675,154.

Hansen, Neil W.; and Orenstein, Nathan, to United States of America, Navy. Search-lock system. 3,675,132, Cl. 325-423.000.

Hantusch, Gerald H.; Vincent, David A.; and Van Tongerloo, Eric H., to Microsystems International Limited. Heat dispersion from a semiconductor wafer by a multiplicity of unaligned minuscule heat conductive raised dots. 3,675,089, Cl. 317-234.

Harding, Philip A., to Electronic Memories and Magnetics Corporation. Magnetic core memory line sink voltage stabilization system. 3,675,221, Cl. 340-174.0tb.

Hardwick, John David: *See*—
Wright, David Ellis; and Hardwick, John David, 3,673,705.

Hardy, John C., to Angelica Corporation. Pouch system for hospital patients. 3,674,034, Cl. 128-379.000.

Harkenrider, Robert J.; and Moe, John L., to Waynco, Inc. Control circuit. 3,675,046, Cl. 307-252.00b.

Harmon, Sandra R.: *See*—
Blank, Fritz; Day, William C.; Harmon, Sandra R.; Toncic, Pauline F.; and Yu, Ruey J., 3,674,645.

Harper, James C., to Dresser Industries, Inc. Method and mobile marine platform apparatus having floating submerged mat stabilization. 3,673,974, Cl. 114-.50d.

Harris, Erik P.; Lean, Eric G.; and Powell, Carl G., to International Business Machines Corporation. Internal modulation of injection lasers using acoustic waves. 3,675,150, Cl. 331-94.500.

Harris, Leroy S., to K-G Industries, Inc. Material compacting apparatus. 3,674,397, Cl. 425-145.000.

Harris, Robert J.; and Lee, Irvin J., to Price, H. C., Co. Method for coating pipe. 3,674,546, Cl. 117-94.000.

Harris-Intertype Corporation: *See*—
Maier, Robert E., Jr.; and Moser, James R., 3,674,258.

Harrison, Stanley, to KEV Electronics Corporation. Shielding for a particle accelerator. 3,675,061, Cl. 313-63.000.

Hartman, Leonard; and Sciuto, Joseph, Jr., to Stile-Craft Manufacturers, Inc. Ball valve. 3,674,052, Cl. 137-625.210.

Hartmann, Clinton S.: *See*—
Jones, William Stanley; and Hartmann, Clinton S., 3,675,054.

Hartmann, Clinton S.; and Jones, William S. Cascaded F.M. correlators for long pulses. 3,675,163, Cl. 333-30.00r.

Haruhike, Iwano: *See*—
Iijima, Yoo; Shimamura, Isao; Kondo, Tokiharu; and Haruhike, Iwano, 3,674,491.

Haruna, Takashi; and Taniguchi, Kazutaka, to Nissan Motor Company, Limited. Trigger switch for motor vehicle safety devices. 3,674,951, Cl. 200-61.530.

Harvey, Donad M.: *See*—
Michatek, Chester W.; and Harvey, Donad M., 3,673,938.

Harvey, Donald M., to Eastman Kodak Company. Photographic apparatus. 3,673,939, Cl. 95-13.000.

Harvey, Donald M., to Eastman Kodak Company. Print stripping mechanism. 3,673,940, Cl. 95-13.000.

Harvey, Herbert C., Jr., to Tennessee Valley Authority. Green-wood fibrating means and method. 3,674,219, Cl. 241-152.00r.

Harwell, Earnest W. Tension device for wires, straps, and the like. 3,673,642, Cl. 24-68.00d.

Hasegawa, Goro; and Ito, Masaharu, to Canon Kabushiki Kaisha. Lens barrel. 3,674,343, Cl. 350-250.000.

Hashimoto, Hikotaka: *See*—
Yokotsuka, Tamotsu; Hashimoto, Hikotaka; and Iwaasa, Takashi, 3,674,644.

Hasler A.G.: *See*—
Gruenig, Rudolf; Berger, Erwin; and Sieber, Charles, 3,674,200.

Hasuo, Masayoshi: *See*—
Iwasaki, Koichiro; Yamaguchi, Kazuo; Kimura, Harutaka; Hasuo, Masayoshi; and Tanaka, Toru, 3,674,764.

Hatanaka, Tsutomu: *See*—
Tada, Fusao; Inamine, Seiei; and Hatanaka, Tsutomu, 3,674,897.

Hatcher, John C., to Cole Manufacturing Company. Earthworking apparatus. 3,673,970, Cl. 111-85.000.

Hatori, Yukiyoshi: *See*—
Fukasawa, Noburu; and Hatori, Yukiyoshi, 3,675,227.

Hauser, Hans, to Foote, J. B., Foundry Co., The. Differential. 3,673,889, Cl. 74-713.000.

Hauser, Helmut: *See*—
Philippson, Rainer; Hauser, Helmut; Gibian, Heinz; Kaspar, Emanuel; and Kessler, Hans-Joachim, 3,674,815.

Hausermann, Heinrich: *See*—
Troxler, Eduard; and Hausermann, Heinrich, 3,674,714.

Haven, Roger Lindsy, to Western Electric Company, Incorporated, mesne. Variable digital delay using multiple parallel channels and a signal-driven bit distributor. 3,675,049, Cl. 307-293.000.

Havlas, Jiri; and Sedlarik, Jaroslav, to Elitex Zavody textilniho strojirenstvi generalni reditestvi. Yarn feed control means. 3,673,649, Cl. 28-1.700.

Havranek, Milan; Zouhar, Drahomir; Dusik, Josef; Kucera, Jaromir; and Krejcirik, Jiri, to Elitex-Zavody textilniho strojirestvi, generalni. Knitting machines. 3,673,818, Cl. 66-57.000.

Hawkins, Donald B. Interior door lock. 3,674,297, Cl. 292-252.000.

Hawkins, Royal R., to Honeywell Inc. Indicating means for an automatic dispenser control system. 3,674,177, Cl. 222-52.000.

Hawley, John B., to Akron Spool and Manufacturing Co. Method of making a bobbin barrel. 3,674,069, Cl. 144-326.00r.

Hayakawa, Shohei; Kanematsu, Yoshiko; and Fujiwara, Takashi, to Shionogi & Co., Ltd. Hexahydroindane dicarboxylic acid derivatives. 3,674,842, Cl. 260-514.00r.

Hayase, Yoshiaki: *See*—
Tsuchida, Takashi; Hayase, Yoshiaki; and Fujisawa, Yoshirou, 3,674,561.

Hayashi, Juntaro: *See*—
Ikuo, Yorio; Okabayashi, Minoru; Ono, Keisuke; Mizugaki, Yoshikazu; and Hayashi, Juntaro, 3,674,129.

Hayashi, Yasunori: *See*—
Osaki, Keisuke; Egashira, Hiroshi; and Hayashi, Yasunori, 3,675,206.

Hayashi, Yoshimasa: *See*—
Nakajima, Yasuo; Hayashi, Yoshimasa; and Sugihara, Kunihiko, 3,673,993.

Haycock, Ernest W., to Shell Oil Company. Cathodic protection of closely spaced oil well casings. 3,674,662, Cl. 204-147.000.

Hayes, Robert R.: *See—*
Clingenpeel, William R.; Cain, Charles L.; Hungerford, Philip C., Jr.; and Hayes, Robert R., 3,674,085.

Hayes, Thomas: *See—*
Dacey, Paul F.; De Toma, Samuel; Hayes, Thomas; and Mc Namara, Matthew F., 3,673,712.

Hazell, John E.: *See—*
Hakka, Leo E.; Bata, George L.; and Hazell, John E., 3,674,439.

Heat/Fluid Engineering Corporation: *See—*
Freeman, Darrell L., 3,674,246.

Heckman, Paul J., Jr., to United States of America, Navy. Cable-less television system. 3,674,925, Cl. 178-6.800.

Hedman, Clarence L., Jr.; and Myrenne, Karl-Dieter S., to SCM Corporation. Liquid crystal display device having improved optical contrast. 3,674,341, Cl. 350-160.000.

Hedrick, John R., to Pevrick Engineering Co., Inc. Tool chuck assembly. 3,674,281, Cl. 279-30.000.

Hegenberger, John N., 15% to Loomis, Joseph W., Loomis, Joseph W. and 35% Lehner, Bruce A. Fly swatter. 3,673,730, Cl. 43-137.000.

Heiberger, Francis E., to Danly Machine Corporation. Digital control of press synchronization. 3,675,098, Cl. 318-85.000.

Heijenga, Berend, to Polaroid Corporation. Method and apparatus for shaping temple pieces for spectacles. 3,673,844, Cl. 72-298.000.

Heilhecker, Joe K.: *See—*
Lock, Everett H.; and Heilhecker, Joe K., 3,673,676.

Heilmayr, Peter F.; Kimbrell, Sol B.; and Giuffre, Joseph C., to Certain-Teed Products Corporation. Manufacture of plastic siding. 3,674,388, Cl. 425-72.000.

Heinz, H. J., Company: *See—*
Gutowski, Chester L., 3,674,160.

Heiter, George Ludwig: *See—*
Feldman, Martin; and Heiter, George Ludwig, 3,675,025.

Helmuth, Gene R.: *See—*
Asbelle, Charles C.; Arrigo, Michael F.; Hunting, Kenneth E.; and Helmuth, Gene R., 3,673,613.

Hendley, Dennis Alfred, to Decca Limited. Automatic steering systems. 3,673,977, Cl. 114-144.000.

Hendon, James D., 50% to Hendon, John C. Cotton harvesting bag. 3,674,073, Cl. 150-7.000.

Hendon, John C.: *See—*
Hendon, James D., 3,674,073.

Henkel & Cie G.m.b.H.: *See—*
Aggias, Zissis, 3,674,892.

Henle, Robert A.: *See—*
Bossen, Douglas C.; Henle, Robert A.; Hsiao, Mu Y.; Maley, Gerald A.; and Pricer, W. David, 3,675,200.

Hensen, David, to Machinery and Gears Hansen. Series of gear speed reducers. 3,673,885, Cl. 74-421.00r.

Henshaw, Jo Ann: *See—*
Aszalos, Adorjan; Robison, Robert S.; Kraemer, Nancy; Henshaw, Jo Ann; and Giannini, Mary Suzanne, 3,674,867.

Herman, David L. Xerographic copying device. 3,674,361, Cl. 355-8.000.

Hermstein, Wolfgang; and Mollenbeck, Klaus, to Siemens Aktiengesellschaft. Device for measuring currents in a high voltage conductor by modulated radiated beams. 3,675,123, Cl. 324-96.000.

Heron Establishment: *See—*
Garavelli, Giancarlo, 3,674,244.

Herr, George E. Removable tamperproof fasening means. 3,673,912, Cl. 85-45.000.

Herrero, Jose: *See—*
Rheiner, Alfred, Jr.; Fernex, Michel; and Herrero, Jose, 3,674,872.

Herring, James M., Jr.: *See—*
Santos, Gerard R.; and Herring, James M., Jr., 3,674,107.

Herter, George L., to Herter's, Inc. Over-shot wad for shotshells. 3,673,965, Cl. 102-95.000.

Herter's, Inc.: *See—*
Herter, George L., 3,673,965.

Hester, Jackson B., Jr., to Upjohn Company, The. Process for preparing 1,3-dihydro-5-phenyl-2H-1,4-benzodiazepine-2-thiones. 3,674,777, Cl. 260-239.30d.

Heugebaert, Frans Clement: *See—*
Vrancken, Marcel Nicolas; Brinckman, Eric Maria; and Heugebaert, Frans Clement, 3,674,483.

Hewlett-Packard Company: *See—*
Cutler, Leonard S.; Holloway, Joseph H.; and Turner, Wilson R., 3,675,149.
Dukes, John N., 3,674,371.
Spangler, Richard M., 3,675,213.

Heyer, William T.; and Soukup, Dale F. Flush valve. 3,674,237, Cl. 252-32.000.

Heywang, Walter; and Sirtl, Erhard, to Siemens Aktiengesellschaft. Method of producing semiconductor components on a magnetic substrate. 3,674,552, Cl. 117-217.000.

Hickner, George B.: *See—*
Howard, Donald W.; and Hickner, George B., 3,674,320.

Hickner, George B.; Howard, Donald W.; and Suttle, Ward C., to Bendix Corporation, The. Anti-skid braking system utilizing pressure feedback. 3,674,318, Cl. 303-21.00a.

Highberg, Carle W., to Engelhard Hanovia, Inc. Method of polishing glass. 3,673,746, Cl. 51-283.000.

Higuchi, Noboru; Ogawa, Yutaka; and Watanabe, Akihiro, to NGK Insulators, Ltd. Method of manufacturing porcelain for electric insulators by controlling grain size. 3,674,519, Cl. 106-46.000.

Hill, Clifford W. Decorative lamp shades. 3,675,008, Cl. 240-108.000.

Hill, Harold, Jr., mesne: *See—*
Fathauer, George H., 3,675,120.

Hill, Herbert Charles, Jr.: *See—*
Rutledge, Nolan W.; Mercer, Ronald H.; and Hill, Herbert Charles, Jr., 3,673,982.

Hill, Robert C.; French, John M.; and Toepfer, Richard E., to Measurex Corporation. Apparatus for measuring the amount of a substance that is associated with a base material. 3,675,019, Cl. 250-83.30d.

Hille, Arvin A.: *See—*
Tupper, Myron D.; and Hille, Arvin A., 3,674,220.

Hills, Brian. Induction motors. 3,675,060, Cl. 310-172.000.

Hilti Aktiengesellschaft: *See—*
Chromy, Franz, 3,674,101.

Hinata, Masanao: *See—*
Shiba, Keisuke; Hinata, Masanao; Tsuji, Nobuo; and Sato, Akira, 3,674,499.

Hindersinn, Raymond R.: *See—*
Iliopulos, Miltiadis I.; and Hindersinn, Raymond R., 3,674,748.

Hirai, Kenichi: *See—*
Hozumi, Shiro; Hirai, Kenichi; Tanigawa, Yoshiyuki; Yoshida, Katuro; and Sugihara, Kanji, 3,673,666.

Hiraoka, Susumu: *See—*
Kurauchi, Noritaka; Tada, Shotaro; Shima, Hiroshi; Hiraoka, Susumu; Nagao, Taichiro; Koyama, Masahiro; Shiraishi, Satoshi; Shindo, Masuo; and Kobayashi, Yoshinobu, 3,674,990.

Hirata, Miyoshi: *See—*
Naito, Takeo; Hirata, Miyoshi; and Isoda, Sumiro, 3,674,833.

Hirooka, Masaaki: *See—*
Yamamoto, Keisaku; Takao, Hiroyoshi; Hirooka, Masaaki; and Oshima, Teruo, 3,674,755.

Hirose, Yoshio: *See—*
Ikeda, Shigeho; Ishizaki, Ayaaki; Hirose, Yoshio; and Shiro, Teruo, 3,674,639.

Hit Archery Co., Inc.: *See—*
Hitt, Otis H., 3,674,001.

Hitachi, Ltd.: *See—*
Kawasaki, Jun; and Uehara, Hiroshi, 3,675,219.

Hitachi Shipbuilding and Engineering Co., Ltd.: *See—*
Ikuo, Yorio; Okabayashi, Minoru; Ono, Keisuke; Mizugaki, Yoshikazu; and Hayashi, Juntaro, 3,674,129.

Hitt, Otis H., to Hit Archery Co., Inc. Archery bow combination with draw force multiplying means. 3,674,001, Cl. 124-24.000.

Hittmair, Paul: *See—*
Nitzsche, Siegfried; Kaiser, Wolfgang; Wohlfarth, Ernst; and Hittmair, Paul, 3,674,738.

Ho, Edward J.: *See—*
Figge, Erwin E.; and Ho, Edward J., 3,674,348.

Hobart Manufacturing Company, The: *See—*
Davis, Kenneth L., 3,673,852.

Hobrough, Gilbert L., to Hobrough Limited. Automatic orthophoto printer. 3,674,369, Cl. 356-2.000.

Hobrough Limited: *See—*
Hobrough, Gilbert L., 3,674,369.

Hobson, H. M., Limited: *See—*
Glaze, Stanley George, 3,675,225.

Hoegee, Robert A., to Shur-Lok Corporation. Tamper-proof two-way locking nut. 3,674,075, Cl. 151-21.00b.

Hoegger, Anton, to Muller, Hans. Method of regenerating filter aids. 3,674,146, Cl. 210-73.000.

Hoehn, Marvin M.: *See—*
Williams, Robert H.; and Hoehn, Marvin M., 3,674,774.

Hoekstra, Gerald B.; and Jacobs, Robert B., to Standard Oil Company. Process and catalyst for hydroprocessing a resid hydrocarbon. 3,674,680, Cl. 208-111.000.

Hoerner Waldorf Corporation: *See—*
Locke, Frank W., 3,674,133.

Hoffmann, Horst; Krauch, Carl Heinrich; Otto, Hans-Werner; and Volkert, Otto, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Reflective metal plate with photopolymerizable layer containing metal complex dye. 3,674,494, Cl. 96-86.00p.

Hoffmann-La Roche Inc.: *See—*
Edenhofer, Albrecht; and Spiegelberg, Hans, 3,674,799.
Rheiner, Alfred, Jr.; Fernex, Michel; and Herrero, Jose, 3,674,872.

Hogue, Robert M. Strobe flash apparatus. 3,675,073, Cl. 315-149.000.

Holland, Gerald F.: *See—*
Lombardino, Joseph G.; and Holland, Gerald F., 3,674,876.

Hollingworth, Richard Peck: *See—*
Anderson, John Ray; and Hollingworth, Richard Peck, 3,674,466.

Hollis, James E., to Bancroft Racket Company. Adjustable grip for an elongated handle of a game device. 3,674,267, Cl. 273-75.000.

Hollis, Samuel D.: *See—*
Vredenburgh, Walter A.; and Hollis, Samuel D., 3,674,723.

Holloway, Joseph H.: *See—*
Cutler, Leonard S.; Holloway, Joseph H.; and Turner, Wilson R., 3,675,149.

Holman, John G., to Roberts Consolidated Industries, Inc. Means and method for applying facing strips to cores. 3,674,590, Cl. 156-252.000.

Holmer, Bernt Arne Gustaf, to Aktiebolaget Atomenergi. Appliance for interstitial radiation of organs in the body. 3,674,006, Cl. 128-1.200.

Holosonics, Inc., mesne: *See—*
Garlick, George F., 3,673,688.

Holzhfi, Don Earl, to Deere & Company. Impact mowing machine. 3,673,772, Cl. 56-13.100.

Holzman, Richard: *See—*
Curtiss, Robert H.; Holzman, Richard; and Lazarow, Seldan A., 3,673,955.

Honey, Raymond; and Perkins, James Frank, to Firmenich Incorporated. Non-ringing beverages containing poly(oxyethylene)-poly(oxypropylene)-poly (oxyethylene)copolymers. 3,674,502, Cl. 99-28.000.

Honeywell Inc.: *See—*
Cashin, William F.; and Mourning, James R., 3,673,867.
Engle, Gordon A., 3,674,969.
Hawkins, Royal R., 3,674,177.
Kuntz, Leland E., 3,674,094.
Paul, Ian Andrew, 3,675,050.
Power, Gerald P., 3,674,566.

Hooker Chemical Corporation: *See—*
Dittel, Friedrich; and Jorns, Peter, 3,674,699.
Whitesell, George, 3,674,672.

Hoover, Richard D.; and Kohler, George O., to Agri-Tech, Inc. High potency thyroidally active materials prepared by partial acid hydrolysis of idinated protein. 3,674,770, Cl. 260-119.000.

Horacek, Peter: *See—*
Crabtree, Ronald; and Horacek, Peter, 3,674,252.

Horbach, Stephen, to Electronic Associates Inc. Electrical coil and method of manufacturing same. 3,675,174, Cl. 335-299.000.

Hori, Kyoichi: *See—*
Otsuki, Susumu; Hori, Kyoichi; and Miyanohara, Isao, 3,674,651.

Horton, George F. Bracket for mounting boat accessory. 3,674,228, Cl. 248-4.000.

Hosono, Shinichi; and Kida, Kazuyoshi, to Teijin Limited. Method and apparatus for preparing filing in shuttleless loom. 3,674,057, Cl. 139-122.000.

Houdaille Industries, Inc.: *See—*
Barber, Joseph J., 3,675,107.
Roberts, Robert D., 3,674,112.

Houlihan, William J., to Sandoz-Wander, Inc. Dichloro trifluoromethyl phenyl lithium. 3,674,882, Cl. 260-665.00r.

Howard, Donald W.: *See—*
Hickner, George B.; Howard, Donald W.; and Suttle, Ward C., 3,674,318.

Howard, Donald W., to Bendix Corporation, The. Brake lining temperature probe. 3,674,114, Cl. 188-1.00a.

Howard, Donald W.; and Hickner, George B., to Bendix Corporation, The. Adaptive braking control system. 3,674,320, Cl. 303-21.00p.

Howard, Laurence M. Ornamental article. 3,674,616, Cl. 161-62.000.

Howe, Robert K., to Monsanto Company. Herbicidal use of substituted o-phenylenediamines. 3,674,460, Cl. 71-121.000.

Howells, Francis Thomas; and Ashe, Anthony Grenfell, to Shandon-Elliott Limited. Sequential processing apparatus. 3,674,040, Cl. 134-58.00r.

Howlett, George H.; and Howlett, James W., to Howlett Machine Works. Tendon anchorage. 3,673,644, Cl. 24-122.600.

Howlett, James W.: *See—*
Howlett, George H.; and Howlett, James W., 3,673,644.

Howlett Machine Works: *See—*
Howlett, George H.; and Howlett, James W., 3,673,644.

Hoyt, Edwin D.; and Welsh, Luther, to Rama Industrial Heater Co. Zone controlled cook oven. 3,674,982, Cl. 219-403.000.

Hozumi, Shiro; Hirai, Kenichi; Tanigawa, Yoshiyuki; Yoshida, Katuro; and Sugihara, Kanji, to Matsushita Electric Industrial Co., Ltd. Apparatus for assembling and securing electrical components by die compacting. 3,673,666, Cl. 29-203.0dt.

Hsiao, Mu Y.: *See—*
Bossen, Douglas C.; Henle, Robert A.; Hsiao, Mu Y.; Maley, Gerald A.; and Pricer, W. David, 3,675,200.

Huber, Gerhard: *See—*
Lindner, Fritz; Wallhausser, Karl Heinz; and Huber, Gerhard, 3,674,866.

Huber, Manfred; Klimek, Norbert; and Dee, Kenneth Herbert William, to English Numbering Machines Limited. High speed print mechanism with interposer arm for print hammer. 3,673,956, Cl. 101-93.

Huber, Walter E., to Dayco Corporation. Endless track. 3,674,322, Cl. 305-38.000.

Huffman, Jerry P.: *See—*
Auer, John H., Jr.; and Huffman, Jerry P., 3,675,190.

Huffman, Tommie R.: *See—*
Coleman, Michael G.; and Huffman, Tommie R., 3,675,064.

Hughes Aircraft Company: *See—*
Jacobson, Stanley I.; and Sansbury, John R., 3,674,227.

Hughes, William B., to Phillips Petroleum Company. Electrochemical production of nickel (I) complexes. 3,674,661, Cl. 204-73.00r.

Hujer, Friedrich: *See—*
Kohler, Roland; Nagel, Erich; Hujer, Friedrich; and Viehrig, Wolfgang, 3,674,365.

Hungerford, Philip C., Jr.: *See—*
Clingenpeel, William R.; Cain, Charles L.; Hungerford, Philip C., Jr.; and Hayes, Robert R., 3,674,085.

Hunt, Lee D.: *See—*
Hahn, Richard L.; Stone, Roland L.; Tarrant, James R.; and Hunt, Lee D., 3,675,072.

Hunt-Wesson Foods, Inc.: *See—*
Lane, Alan B., 3,674,504.

Hunter, James R.; Lazzarotti, Sebastion James; and Mann, Abe, to Burroughs Corporation. Transport and sorting mechanisms for an automatic conveyor. 3,674,143, Cl. 209-74.000.

Hunter, Stephen R.: *See—*
Scarnato, Thomas J.; Gordon, Paul C.; Hunter, Stephen R.; Krage, Paul W.; and Zablocki, Richard A., 3,673,779.

Hunting, Kenneth E.: *See—*
Asbelle, Charles C.; Arrigo, Michael F.; Hunting, Kenneth E.; and Helmuth, Gene R., 3,673,613.

Huppe, Justin: *See—*
Kunke, Arthur; Reinhardt, Dieter; and Glass, Waldemar, 3,675,023.

Hurko, Bohdan; and Dills, Raymond L., to General Electric Company. Smooth surface electric cooktop. 3,674,983, Cl. 219-462.000.

Huron Manufacturing Corporation: *See—*
Rink, Richard H., 3,675,229.

Hutchins, Burleigh M., Jr.: *See—*
Waters, James L.; Abrahams, Louis; and Hutchins, Burleigh M., Jr., 3,674,373.

Hutchinson, Frank J. Apparatus for loading bags with articles. 3,673,767, Cl. 53-385.000.

Huttenwerk Oberhausen AG: *See—*
Degenkolbe, Joachim; and Musgen, Bruno, 3,674,577.

Hy-Dynamic Co., The, mesne: *See—*
Smith, Robert M., 3,674,162.

Hydril Company: *See—*
Lewis, George E.; and Murman, Fernando, 3,674,123.
Murman, Fernando; and Lewis, George E., 3,674,053.

Hydronautics Incorporated: *See—*
Gollan, Arye, 3,674,684.

Hygena Limited: *See—*
Robinson, George Henry, 3,674,327.

Hytrek, Frederick Paul, to Du Pont de Nemours, E. I., and Company. Non-massing diaryl-p-phenylene diamines. 3,674,705, Cl. 252-400.000.

I'Anson, Thomas. Industrial chain and method of manufacturing same. 3,673,794, Cl. 59-35.000.

I.C.B.S.P.A. Industria Chimica e Biologica: *See—*
Formisano, Mario; and Coppola, Salvatore, 3,674,649.

Ichiki, Eiichi; Iida, Kazuo; Inoue, Yasuhiko; and Kondo, Yoshihiro, to Sumitomo Chemical Company, Limited. Aluminum plating process. 3,674,541, Cl. 117-62.000.

Ichimura, Nobuyoshi: *See—*
Suzuki, Yoshiro; Nagahara, Shigehiro; and Ichimura, Nobuyoshi, 3,674,520.

Ida, Keisuke: *See—*
Kubota, Tadao; and Ida, Keisuke, 3,674,382.

Ideal Toy Corporation: *See—*
Cooper, Julius; and Nielsen, Edwin A., 3,674,269.

Iemura, Toshio; Doi, Masaru; and Shimizu, Yoshiaki, to Sanyo Electric Co., Ltd. Magnetic transducer heads. 3,674,944, Cl. 179-100.20c.

Ierusalimskaya, Irina Nikolaevna: *See—*
Borkovsky, Gennady Mikhailovich; Tsukernik, Vitaly Borisovich; and Ierusalimskaya, Irina Nikolaevna, 3,675,194.

Iguchi, Takashi: *See—*
Takeda, Isao; Iguchi, Takashi; Tsuzuki, Katsuaki; and Nakano, Tooru, 3,674,639.

Iha, Kiyoshi, to Bell & Howell Company. Film cartridge support assembly for projectors. 3,674,347, Cl. 352-73.000.

Iida, Kazuo: *See—*
Ichiki, Eiichi; Iida, Kazuo; Inoue, Yasuhiko; and Kondo, Yoshihiro, 3,674,541.

Iijima, Yoo; Shimamura, Isao; Kondo, Tokiharu; and Haruhike, Iwano, to Fuji Photo Film Co., Ltd. Developing process. 3,674,491, Cl. 96-66.300.

Ikeda, Shigeho; Ishizaki, Ayaaki; Hirose, Yoshio; and Shiro, Teruo, to Ajinomoto Co., Inc. and Sanraku Ocean Co., Ltd. Method of producing L-glutamic acid by fermentation. 3,674,639, Cl. 195-28.00r.

Ikuo, Yorio; Okabayashi, Minoru; Ono, Keisuke; Mizugaki, Yoshikazu; and Hayashi, Juntaro, to Hitachi Shipbuilding and Engineering Co., Ltd. Overhead traveling sandslinger. 3,674,129, Cl. 198-44.000.

Iles, Frank. Pumps. 3,674,383, Cl. 417-476.000.

Iliopulos, Miltiadis I.; and Hindersinn, Raymond R., to Borg-Warner Cororation, mesne. Polyesters containing aminoalkylphosphonates. 3,674,748, Cl. 260-75.00p.

Illigen, Alfred; and Neugebauer, Walter, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Process for the pyrogenic making of highly dispersed silicon dioxide. 3,674,430, Cl. 23-182.000.

Illinois Tool Works Inc.: *See—*
Landuyt, John F., 3,675,243.

Ilseder Hutte, Firma: *See—*
Hanig, Siegfried; and Langer, Alfred, 3,673,806.

Imperial Chemical Industries Limited: *See—*
Averill, Frederick John; and Riley, Norman, 3,674,852.
Brooks, Martin Frederick; and Kerrigan, Vincent, 3,674,828.
Colchester, John Edward; Carey, John Gerard; and Taylor, Michael David, 3,674,797.
Freeman, Peter Frank Hilary, 3,674,877.
Komander, Alfons Anzelm, 3,674,527.
Porter, Kenneth; and Richardson, Brian, 3,674,744.

Rigby, Charles Herbert, 3,673,964.
IMS Limited, mesne: *See*—
Ogle, Robert W., 3,674,028.
Inaba, Shigeho; Akatsu, Mitsuhiro; and Yamamoto, Hisao, to Sumitomo Chemical Company, Ltd. 1-Hydroxyalkyl-2-aminomethylindole derivatives. 3,674,808, Cl. 260-326.150.
Inaba, Yoshinari: *See*—
Yamadai, Tadaaki; Kushida, Tadao; Konishi, Hiroshi; and Inaba, Yoshinari, 3,673,631.
Inagaki, Tokuichi: *See*—
Aono, Shigeo; Manaka, Nobuzi; and Inagaki, Tokuichi, 3,673,989.
Inamine, Seiei: *See*—
Tada, Fusao; Inamine, Seiei; and Hatanaka, Tsutomu, 3,674,897.
Industrial Problem Solves, Inc.: *See*—
Crook, Richard D., 3,673,668.
Industrie Pirelli S.p.A., mesne: *See*—
Caretta, Renato; and Pacciarini, Antonio, 3,674,899.
Inforex, Inc.: *See*—
Steranko, James J., 3,673,681.
Infrarodteknik AB: *See*—
Elsner, Nils Ake; and Nilson, Hans Erik, 3,674,513.
Ingestrom, Curt Holger: *See*—
Bokvist, Kjell; and Ingestrom, Curt Holger, 3,673,750.
Inomata, Isao: *See*—
Ueda, Isao; Kageyama, Takao; and Inomata, Isao, 3,675,165.
Inoue, Yasuhiko: *See*—
Ichiki, Eiichi; Iida, Kazuo; Inoue, Yasuhiko; and Kondo, Yoshihiro, 3,674,541.
Inpat Establishment: *See*—
Marchiorello, Giovanni, 3,673,736.
Institut Francais du Petrole des Carburants et Lubrifiants: *See*—
Derrien, Michel; and Le Page, Jean Francois, 3,674,888.
Institut Gornogo Dela Siberskogo otdelenia Akademii Nauk SSSR: *See*—
Kostylev, Alexandr Dmitrievich; Gurkov, Konstantin Stepanovich; Tkach, Khaim Berkovich; and Lipovetsky, Lazar Moiseevich, 3,674,099.
Institut Textile de France: *See*—
Parisot, Andre; and Meimoun, Daniel, 3,674,539.
Intercraft Industries Corporation: *See*—
Bell, Randall P.; and Vanderhoef, John P., 3,673,724.
Lazar, Burton A.; Bell, Randall P.; and Vanderhoef, John P., 3,673,723.
Interdata, Incorporated: *See*—
Ellis, David R.; Michels, John; and Gabbert, Ira, 3,675,214.
Interlake, Inc.: *See*—
Stahnke, Edward J., 3,674,972.
International Agri-Systems, Inc.: *See*—
Crane, Edward J., 3,673,637.
International Business Machines Corporation: *See*—
Arnold, Richard F.; Dauber, Philip S.; and Sussenguth, Edward H., 3,675,215.
Bossen, Douglas C.; Henle, Robert A.; Hsiao, Mu Y.; Maley, Gerald A.; and Pricer, W. David, 3,675,200.
Dauber, Philip S.; Robelen, Russell J.; and Wierzbicki, John R., 3,675,217.
Druschel, William O., 3,674,487.
Fang, Frank F.; and Lean, Eric G., 3,675,140.
Frankeny, Richard F.; and Tuttle, Joey K., 3,675,133.
Grandia, Johannes; and Rohr, Robert Lewis, 3,674,004.
Harris, Erik P.; Lean, Eric G.; and Powell, Carl G., 3,675,150.
James, Randell L., 3,675,216.
Kolpek, Robert A., 3,674,125.
Pickholtz, Raymond L., 3,675,131.
Raviv, Josef, 3,675,211.
Raviv, Josef; and Wesley, Michael A., 3,675,212.
Sechler, Robert F., 3,675,218.
Singh, Shanker, 3,675,001.
Woodall, Jerry M., 3,675,026.
International Fineblanking Corporation: *See*—
Smith, Roger K., 3,673,908.
International Harvester Company: *See*—
Scarnato, Thomas J.; Gordon, Paul C.; Hunter, Stephen R.; Krage, Paul W.; and Zablocki, Richard A., 3,673,779.
International Paper Company: *See*—
Allport, Walter F., 3,674,583.
Allport, Walter F., 3,674,607.
International Rubber Industries, Inc.: *See*—
Lucci, Donald E., 3,674,068.
International Standard Electric Corporation: *See*—
Bamberg, Paul, 3,675,130.
International Stretch Products, Inc.: *See*—
Sarmiento, Louis, 3,673,820.
International Telephone and Telegraph Corporation: *See*—
Erdmann, M. Otto, 3,674,215.
Grant, John M., 3,675,028.
Iowa State University Research Foundation, Inc.: *See*—
Handy, Richard L., 3,673,861.
Ippen, Erich Peter: *See*—
Ashkin, Arthur; and Ippen, Erich Peter, 3,674,335.
I.S.A.P. SpA.: *See*—
Padovani, Pietro, 3,674,168.
Ishii, Hirozi; and Okamoto, Koichi, to Nissan Motor Company, Limited. Method for bonding vanes in torque converter. 3,673,659, Cl. 29-156.8cf.
Ishizaki, Ayaaki: *See*—
Ikeda, Shigeho; Ishizaki, Ayaaki; Hirose, Yoshio; and Shiro, Teruo, 3,674,639.
Isoda, Sumiro: *See*—
Naito, Takeo; Hirata, Miyoshi; and Isoda, Sumiro, 3,674,833.
Isoya, Toshiro: *See*—
Seko, Maomi; Ogawa, Shinsaku; Komori, Ryozo; Asuma, Masaro; Isoya, Toshiro; and Sakai, Takamasa, 3,674,653.
Israel Atomic Energy Commission, State of: *See*—
Aladjem, Abraham, 3,675,021.
Israel, Henry M., to Raytheon Company. Resonant charging circuit. 3,675,116, Cl. 323-17.000.
Israel Mining Industries-Institute for Research and Development: *See*—
Waterman, Jacques Abraham; Shaham, Ilan; and Shorr, Leonard M., 3,674,756.
Istituto Farmacologico Serono S.p.A.: *See*—
Donini, Pietro, 3,674,865.
Itek Corporation: *See*—
Wyman, John E., 3,674,489.
Iten, Clemens A., to Morris, Philip, Incorporated. Method of joining two bodies in captive, independently rotatable assembly. 3,673,672, Cl. 29-443.000.
Iten, Paul Dominik; and Mottier, Francois, to Brown Boveri & Company Limited. Methods and means for measuring the velocities of localized portions of flowing media. 3,675,029, Cl. 250-218.000.
Ito, Katsunori: *See*—
Kato, Takaaki; Kawakubo, Mamoru; and Ito, Katsunori, 3,673,892.
Ito, Masaharu: *See*—
Hasegawa, Goro; and Ito, Masaharu, 3,674,343.
Ito, Michinobu: *See*—
Watanabe, Shigeru; and Ito, Michinobu, 3,673,745.
Iwaasa, Takashi: *See*—
Yokotsuka, Tamotsu; Hashimoto, Hikotaka; and Iwaasa, Takashi, 3,674,644.
Iwamoto, Minoru, to Ricoh Co., Ltd. Device for electrophotocopying machines for detecting whether a usable length of copy paper is left on a roll thereof. 3,675,228, Cl. 340-259.000.
Iwamoto, Shunsuke; and Kawasaki, Ryohei, to Omron Tateisi Electronics Co. Apparatus for detecting traffic information. 3,675,195, Cl. 340-38.00l.
Iwasa, Hitoo: *See*—
Teramoto, Iwao; Iwasa, Hitoo; Miyai, Yukio; and Takeshima, Masumi, 3,675,161.
Iwasaki, Koichiro; Yamaguchi, Kazuo; Kimura, Harutaka; Hasuo, Masayoshi; and Tanaka, Toru, to Mitsubishi Chemical Industries Limited. Process for the polymerization of olefins. 3,674,764, Cl. 260-88.20r.
Izumo, Masanori; and Yoshimura, Tatsushiro, to Daikin Kogyo Co., Ltd. Method for preparing polytetrafluoroethylene molding powder. 3,674,762, Cl. 260-87.500.
Jackson, George: *See*—
Sturgeon, George; and Jackson, George, 3,674,389.
Jackson, Paul Louis, to Ford Motor Company. Determination of oxygen in molten steel. 3,674,654, Cl. 204-1.00t.
Jacob, Jean-Baptiste, to C.I.T.-Compagnie Industrielle des Telecommunications and Societe Lannionaise d'Electronique. Expanded multi-stage time connection network. 3,674,938, Cl. 179-15.0aq.
Jacob, Louis, to Commissariat a l'Energie Atomique. Device for improving the optical qualities of a laser beam. 3,674,340, Cl. 350-157.000.
Jacobs, Robert B.: *See*—
Hoekstra, Gerald B.; and Jacobs, Robert B., 3,674,680.
Jacobson, Stanley I.; and Sansbury, John R., to Hughes Aircraft Company. Fragmenting cover. 3,674,227, Cl. 244-121.000.
Jacobson, Sydney; Knowles, Denis; and Parker, Derek, to Montague Burton Limited. Method of bonding an interlining to a garment using stray field dielectric heating. 3,674,592, Cl. 156-274.000.
Jacuzzi Research, Inc.: *See*—
Jacuzzi, Roy A., 3,674,020.
Jacuzzi, Roy A., to Jacuzzi Research, Inc. Pool hydromassage assembly. 3,674,020, Cl. 128-66.000.
Jadair, Incorporated: *See*—
Schmutzler, David L.; and Schmutzler, John H., 3,674,145.
Jaecklin, Andre, to Aktiengesellschaft Brown, Boveri & Cie. Optical wattmeter. 3,675,125, Cl. 324-96.000.
Jaeger: *See*—
Leyri, Claude, 3,673,786.
Jalbert, Armand F. Temp-a-check. 3,673,870, Cl. 73-349.000.
James, Jack L.: *See*—
Siedband, Melvin P.; Duffy, Philip A., Jr.; and James, Jack L., 3,675,020.
James, Randell L., to International Business Machines Corporation. No clock shift register and control technique. 3,675,216, Cl. 340-172.500.
Jamison, Robert W.; and Norcross, Paul A., to Union Oil Company of California. Vehicle position marking device. 3,675,199, Cl. 340-62.000.
Jammaud, Andre, to Societe Industrielle Honeywell Bull Societe Anonyme. Signaling and control apparatus slidably and swingably mounted on a supporting cabinet. 3,675,084, Cl. 317-101.0cb.
Janssen, Casper Johannes Gerardus Ferdinand: *See*—
Jonker, Hendrik; Janssen, Casper Johannes Gerardus Ferdinand; and Postma, Lambertus, 3,674,485.
Janssen, Heinrich: *See*—

Schmalfeld, Paul; Janssen, Heinrich; Bock, Burkhard; Peters, Werner; and Ahland, Erwin, 3,674,449.
Jaquish, John, to Trans-World Display Corporation. Multiple size package display and dispenser. 3,674,175, Cl. 221-92.000.
Jarleborg, Martin Holger: *See*—
Hallstrom, Ingemar Gustaf Terje; Jarleborg, Martin Holger; and Tarnblom, Stig-Goran Harry, 3,674,570.
Jarva, Inc.: *See*—
Scaravilli, Joseph V., 3,674,314.
Jarvis, James G., to Eastman Kodak Company. Xerothermographic process. 3,673,961, Cl. 101-465.000.
Jayne, Max L.; and Pihlblad, Robert W., to Sylvania Electric Products, Inc. Means for polaring a connector assembly. 3,675,186, Cl. 339-186.00m.
Jeffery, Robert W.; Brown, Robert A., Jr.; and Cullen, Allen F., to Sperry Rand Corporation. Outboard drive unit for boats. 3,673,978, Cl. 115-35.000.
Jeffreys, Roy A.; and Thomas, David A., to Eastman Kodak Company. Photographic elements containing fluorescent brightening agents. 3,674,493, Cl. 96-72.000.
Jellison, Frank R.; Mason, John B.; and McQueen, Terry K., to General Motors Corporation. Suspension strut. 3,674,283, Cl. 280-124.00r.
Jendrisak, Joseph E.; and McKelvey, Harold E., to Shatterproof Glass Corporation. Glass cutting apparatus. 3,673,900, Cl. 83-11.000.
Jenkins, Francis Edward, to Du Pont de Nemours, E. I., and Company. Process for preparing microporous, open-celled cellular polyamide, polyester and polyacetal structures. 3,674,719, Cl. 260-2.50m.
Jennings, Doris E. Back scrubber. 3,674,374, Cl. 401-8.000.
Jennings, Peter H.: *See*—
Stanley, Robert W.; Ames, Horace L.; and Jennings, Peter H., 3,674,424.
Jessup, Richard J., to Udylite Corporation. Apparatus for electroplating workpieces. 3,674,673, Cl. 204-213.000.
Jezuit, Leslie J.; and Kollars, Harold R., to North American Rockwell Corporation. Dampening system for lithographic printing press. 3,673,959, Cl. 101-148.000.
Johannsmeier, Karl-Heinz. Out of contact optical alignment and exposure apparatus. 3,674,368, Cl. 355-78.000.
Johnson, Curtis C., to Battelle Development Corporation, The, mesne. Quantitative pulsed transilluminator and method of operation. 3,674,008, Cl. 128-2.00a.
Johnson, Gary L.: *See*—
La Barge, Robert G.; and Johnson, Gary L., 3,674,858.
Johnson, Henry V., to United States of America, Army. Buoy. 3,674,225, Cl. 244-31.000.
Johnson, Lowell E.: *See*—
Audiffred, Sidney J.; Johnson, Lowell E.; and Pearce, Shairyl I., 3,673,799.
Johnson, Martin Robert, to Prenihan A.G., mesne. Knit garment and method of manufacture. 3,673,821, Cl. 66-177.000.
Johnson, Ralph S., to General Motors Corporation. Auxiliary shock absorber damping valves. 3,674,120, Cl. 188-277.000.
Johnson, Ronald W.: *See*—
Artaud, Maurice H.; Johnson, Ronald W.; and Sampath, Prativadi I., 3,674,354.
Johnston, Richard W., to General Motors Corporation. Induction motor regenerative braking system. 3,675,099, Cl. 318-211.000.
Jones & Laughlin Steel Corporation: *See*—
Kuszaj, Alex Mark, 3,673,816.
Manka, Dan Paul, 3,673,854.
Paliwoda, Eugene J., 3,674,084.
Shellenberger, Donald J., 3,674,248.
Wlodek, Stanley Thaddeus, 3,674,445.
Jones, Alton R. Stereo lock. 3,673,828, Cl. 70-58.000.
Jones, Charles: *See*—
Larrinaga, John; and Jones, Charles, 3,674,384.
Jones, David Thomas; Jowett, George Edward; and Webster, Edward Ernest, to Sponcel Limited. Catamenial tampons or the like. 3,674,030, Cl. 128-285.000.
Jones, Edward Stephen: *See*—
Sweeney, Richard F.; Khan, Aziz Urrehman; Price, Alson K.; Jones, Edward Stephen; and Otto, Julian A., 3,674,800.
Jones, Frank D. Lloyd, to Deere & Company. Self-propelled agricultural machine. 3,673,775, Cl. 56-14.700.
Jones, Garth S.: *See*—
Dewey, Raymond D.; Mapes, Robert S.; and Jones, Garth S., 3,674,926.
Jones, Howard: *See*—
Shen, Tsung-Ying; Jones, Howard; Witzel, Bruce E.; and Walford, Gordon L., 3,674,844.
Jones, Philip Michael; and Walsh, Raymond Herbert, to United Kingdom Atomic Energy Authority. Nuclear reactor means for minimizing lateral vibrations. 3,674,636, Cl. 176-77.000.
Jones, Warren E.: *See*—
Kirkham, Jackie L.; and Jones, Warren E., 3,674,992.
Jones, William S.: *See*—
Hartmann, Clinton S.; and Jones, William S., 3,675,163.
Jones, William Stanley; and Hartmann, Clinton S., to Texas Instruments, Incorporated. Series connection of interdigitated surface wave transducers. 3,675,054, Cl. 310-9.800.
Jonker, Hendrik; Janssen, Casper Johannes Gerardus Ferdinand; and Postma, Lambertus, to U.S. Philips Corporation, mesne. Method of manfacturing electrically conducting metal layers. 3,674,485, Cl. 96-35.000.
Jonsson, Finn Lennart; Trolle, Stern; and von Platen, Baltzar Carl, to Etablissement Radiator. High-pressure apparatus. 3,674,403, Cl. 425-330.000.
Jonsson, Per Hjalmar, to Rederiaktiebolaget Nordstjernan. Chemical oxygen demand water analyzer. 3,674,370, Cl. 356-36.000.
Jordan, Thomas M., Jr., to General Electric Company. Video shading modulator with paraphase control signals applied respectively to variable impedance devices in series and in parallel with the video signal path. 3,674,927, Cl. 178-7.200.
Jordan, William Robert: *See*—
McCloskey, Fenimore G.; and Jordan, William Robert, 3,675,166.
Jorns, Peter: *See*—
Dittel, Friedrich; and Jorns, Peter, 3,674,699.
Joseph A. David, to Eutectic Corporation. Alloy. 3,674,471, Cl. 75-153.000.
Joseph, Louis. Spacer and stabilizer for insertion between adjacent convolutions of an automobile coil spring. 3,674,250, Cl. 267-61.000.
Jowett, George Edward: *See*—
Jones, David Thomas; Jowett, George Edward; and Webster, Edward Ernest, 3,674,030.
Judd, Frank Fuller; and Wilhart, Helmut, to Bell Telephone Laboratories, Incorporated. Self-oscillating switching regulator with secondary switching control signal to regulate switching frequency. 3,675,158, Cl. 331-109.000.
Judd, Frank Fuller; Lieberman, Jan Mark; and Wilhart, Helmut, to Bell Telephone Laboratories, Incorporated. Self-oscillating switching regulator with frequency responsive feedback loop gain control. 3,675,159, Cl. 331-109.000.
Jung, Lothar, to Amersil Inc. Furnace for making fused quartz hollow slugs. 3,674,904, Cl. 13-20.000.
Jungermann, Eric: *See*—
Tiefenthal, Harlan E.; Jungermann, Eric; Miller, Eugene J., Jr.; and Callahan, John J., 3,674,879.
Jurina, Olge Demidovna: *See*—
Bokov, Jury Sergeevich; Vikulina, Ninel Vladimirovna; Dogadkin, Boris Aristarkhovich; Erofeev, Boris Vasilievich; Larina, Anastasia Vasilievna; Lavrischev, Vadim Petrovich; Markov, Vladimir Vladimirovich; Naumova, Sofia Fadeevna; Jurina, Olge Demidovna; and Yarovaya, Galina Dmitrievne, 3,674,496.
Jursich, Myron J.: *See*—
Aitken, Thomas; Anderson, Donald R.; and Jursich, Myron J., 3,674,725.
Juve, Robert J., to Udylite Corporation, The. Work carrier accumulation mechanism. 3,674,127, Cl. 198-19.000.
K-G Industries, Inc.: *See*—
Harris, Leroy S., 3,674,397.
Kaasenbrood, Petrus J. C.; and van Nassau, Petrus J. M., to Stamicarbon N.V. Process for urea production in combination with ammonia synthesis. 3,674,847, Cl. 260-555.00a.
Kabushiki Kaisha Daini Seikosha: *See*—
Kurihara, Kazuo, 3,673,788.
Kabushiki Kaisha Ricoh: *See*—
Ando, Sadanao, 3,674,362.
Kubo, Keishi; and Sakai, Kiyoshi, 3,675,013.
Kabushiki Kaisha Towa Denki: *See*—
Watanabe, Takashi, 3,673,907.
Kabushiki Kaisha Toyota Chuo Kenkyusho: *See*—
Kimura, Takashi; Majima, Azusa; Hamamoto, Hiroshi; and Awano, Yoji, 3,674,472.
Kabushiki-Kaisha Tokai Rika Denki Seisakusho: *See*—
Mizuno, Tadasi, 3,673,829.
Kabushikikaisha Aichidenkikosakusho: *See*—
Yamamoto, Osamu, 3,673,682.
Kageyama, Takao: *See*—
Ueda, Isao; Kageyama, Takao; and Inomata, Isao, 3,675,165.
Kaiser Aluminum & Chemical Corporation: *See*—
Plichta, Dietmar G., 3,673,899.
Kaiser, Carl; and Zirkle, Charles L., to Smith Kline & French Laboratories. 1-(Benzoheterocyclic cyclopropylmethyl)-4-phenyl-4-piperidinols. 3,674,792, Cl. 260-293.570.
Kaiser, Rudolf, to Neue Argus Gesellschaft m.b.H. Shaft bearing sealed against pressure. 3,674,326, Cl. 308-36.100.
Kaiser, Wolfgang: *See*—
Nitzsche, Siegfried; Kaiser, Wolfgang; Wohlfarth, Ernst; and Hittmair, Paul, 3,674,738.
Kakumu, Ichizo; and Oshima, Susumu, to Toyoda Koki Kabushiki Kaisha. Apparatus for dressing grinding wheels. 3,674,003, Cl. 125-11.000.
Kaldor, Leslie M.: *See*—
Di Crispino, Joseph S.; and Kaldor, Leslie M., 3,673,862.
Kalnin, Ilmar L.; and Breckenridge, George J., to Celanese Corporation. Production of fiber reinforced composites. 3,674,581, Cl. 156-84.000.
Kalopissis, Gregoire; Gascon, Jean; Gallien, Jacqueline; Bugaut, Andree; and Gaston-Breton, Hubert, to l'Oreal. Dyeing human hair and composition for including an oxidation dye and coupler thereof. 3,674,414, Cl. 8-11.000.
Kalopissis, Gregoire; and Vanlerberghe, Guy, to Societe Anonyme dite: L'Oreal. Hair cosmetic compositions containing non-ionic surface active agents. 3,674,902, Cl. 424-70.
Kaminow, Ivan Paul; and Weber, Heinz Paul, to Bell Telephone Laboratories, Incorporated. Tunable laser in a sensitized transparent

material including an internal resonator and optical guide. 3,675,157, Cl. 331-94.500.

Kampfer, Helmut; von Konig, Anita; Ranz, Erwin; von Rintelen, Harald; Mayer, Dietmar; and Sasse, Klaus, to Agfa-Gevaert Aktiengesellschaft. Photographic dry copying process. 3,674,479, Cl. 96-27.000.

Kampfer, Helmut; Von Konig, Anita; Ranz, Erwin; von Ritelen, Harald; Mayer, Dietmar; and Sasse, Klaus, to Agfa-Gevaert Aktiengesellschaft. Photographic dry copying process. 3,674,480, Cl. 96-29.000.

Kanai, Toshio: *See*—
Washimi, Koichi; Kanbayashi, Masaaki; Kanai, Toshio; and Fujimori, Akihiro, 3,674,679.

Kanamaru, Tsuneo: *See*—
Yamatodani, Saburo; and Kanamaru, Tsuneo, 3,674,642.

Kanbayashi, Masaaki: *See*—
Washimi, Koichi; Kanbayashi, Masaaki; Kanai, Toshio; and Fujimori, Akihiro, 3,674,679.

Kaneko, Tadataka: *See*—
Naomoto, Susumu; Kaneko, Tadataka; and Esaki, Hideya, 3,675,091.

Kanematsu, Yoshiko: *See*—
Hayakawa, Shohei; Kanematsu, Yoshiko; and Fujiwara, Takashi, 3,674,842.

Kapafar Business Trust Reg.: *See*—
Wahlen, Werner; and Blumber, Hans, 3,673,920.

Kappus, Peter G.: *See*—
Krebs, James Norton; and Kappus, Peter G., 3,673,802.

Karll, Robert E.; and Lee, Richard J., to Standard Oil Company. Mineral lubricating oil containing high molecular weight alkyl substituted phenolic sulfonamide. 3,674,691, Cl. 252-47.500.

Kaser, Alfred, to Aktiengesellschaft Brown, Boveri & Cie. Chip deformer and breaker for use with metal cutting tool. 3,673,653, Cl. 29-96.000.

Kasik, Robert L.; and Luksas, Anthony J., to Beatrice Foods Co. Production of cheese flavor. 3,674,508, Cl. 99-140.

Kaspar, Emanuel: *See*—
Philippson, Rainer; Hauser, Helmut; Gibian, Heinz; Kaspar, Emanuel; and Kessler, Hans-Joachim, 3,674,815.

Kasselmann, John T., to Bendix Corporation, The. Hydraulic rate gyro for an adaptive steering system. 3,673,875, Cl. 74-5.430.

Kato, Takaaki; Kawakubo, Mamoru; and Ito, Katsunori, to Nippondenso Kabushiki Kaisha. Kick-down control system for use in automatic transmission system of automobiles. 3,673,892, Cl. 074/870.

Kaufman, Jonas J. Hand truck for oil drums and the like. 3,674,164, Cl. 214-377.000.

Kautsky, George J.: *See*—
Richardson, Wallace L.; Kautsky, George J.; and Barusch, Maurice R., 3,674,826.

Kawai, Kazuo: *See*—
Yanagidaira, Hidetaka; Kawai, Kazuo; and Shintani, Sotokichi, 3,674,996.

Kawakubo, Mamoru: *See*—
Kato, Takaaki; Kawakubo, Mamoru; and Ito, Katsunori, 3,673,892.

Kawasaki, Jun; and Uehara, Hiroshi, to Hitachi, Ltd. Dynamic memory system having signal holding device. 3,675,219, Cl. 340-173.0rc.

Kawasaki, Ryohei: *See*—
Iwamoto, Shunsuke; and Kawasaki, Ryohei, 3,675,195.

Kawatetsu Kizai Kogyo Co., Ltd.: *See*—
Murashige, Hidekichi; Simakura, Masao; and Nakazawa, Kazuo, 3,673,754.

Kay, Garth: *See*—
Lilly, Malcolm Douglas; Kay, Garth, and; Wilson, Richard John Hugh; and Sharp, Alister Kimball, 3,674,767.

Kay Laboratories, Inc.: *See*—
Turner, Charles D., 3,674,134.

KDI-Bauer Corporation: *See*—
Bauer, Russell E., 3,674,380.

Kearney & Trecker Corporation: *See*—
Zankl, Frank, 3,673,918.
Zankl, Frank; and Lohneis, Earl R., 3,674,323.

Keefer, Dayle: *See*—
Adam, Robert; and Keefer, Dayle, 3,673,694.

Keeler Brass Company: *See*—
Keeler, Miner S., II, 3,674,229.
Van Ryn, Edwin; and Driesenga, Edwin J., 3,673,634.

Keeler, Miner S., II, to Keeler Brass Company. Shelving supports. 3,674,229, Cl. 248-188.000.

Kefalas A/S: *See*—
Schou, Jorgen Martin Dohm, 3,674,868.

Kegerise, Harry L.: *See*—
Ladin, Eli M.; Kegerise, Harry L.; and Adams, John S., 3,674,357.

Kehoe, Lawrence J.: *See*—
Schell, Raymond A.; and Kehoe, Lawrence J., 3,674,889.

Kelemen, Denis G., to Du Pont de Nemours, E. I., and Company. Metalizing composition including degassed platinum powders. 3,674,515, Cl. 106-1.000.

Keller, Albert Kent: *See*—
Larsen, Eric R.; Keller, Albert Kent; and Plepys, Raymond A., 3,674,664.

Keller, C.: *See*—
Wieligmann, Friedrich, 3,673,703.

Keller Manufacturing Co., Inc.: *See*—
Keller, William A., 3,673,893.

Keller, William A., to Keller Manufacturing Co., Inc. Method of making rake tine support. 3,673,893, Cl. 76-111.000.

Kelley, Fred W., Jr., to General Electric Company. Means for damping voltage oscillations in solid-state switching circuits. 3,675,110, Cl. 321-14.000.

Kelley, Raymond E. Adjustable trunk lid holder. 3,674,299, Cl. 292-262.000.

Kelling, Leroy U. C., to General Electric Company. Numerical function generator. 3,674,999, Cl. 235-152.

Kelly, Jack L.; and Wiandt, Ronald K., to General Electric Company. Velocity trip mechanism. 3,674,277, Cl. 274-1.00l.

Kendall, Don Leslie, to Texas Instruments, Inc. Computer controlled device testing and subsequent arbitrary adjustment of device characteristics. 3,674,995, Cl. 235-151.100.

Kenmotsu, Yoko: *See*—
Nagasawa, Taro; Tomita, Mamoru; Obayashi, Tomokazu; Tamura, Yoshitaka; and Kenmotsu, Yoko, 3,674,500.

Kennedy, David Rankine: *See*—
Shephard, Robert Basil; Clachan, Margaret Loudon; Kennedy, David Rankine; and Abbott, Terence Arnold, 3,674,531.

Kenyon, Kenneth H.: *See*—
Bergum, Bernard C.; and Kenyon, Kenneth H., 3,674,565.

Keogh, Raymond J.; and Wilczek, Frank J., to Photocircuits Corporation. Apparatus for making wire scribed circuit boards. 3,674,602, Cl. 156-380.000.

Kern, Joerg, to Ciba-Geigy Corporation. Heterocyclic compounds. 3,674,811, Cl. 260-338.000.

Kerr-McGee Chemical Corporation, mesne: *See*—
Baldwin, Roger A.; and Cheng, Ming T., 3,674,742.

Kerrigan, Vincent: *See*—
Brooks, Martin Frederick; and Kerrigan, Vincent, 3,674,828.

Kertesz, Imre: *See*—
Estes, Joseph F.; and Kertesz, Imre, 3,673,873.

Kerwin, Robert Eugene: *See*—
Goldrick, Michael Richard; Kerwin, Robert Eugene; and Skinner, John George, 3,674,492.

Kessler, Clarence W.: *See*—
Ackerman, Howard T.; and Kessler, Clarence W., 3,675,239.

Kessler, Hans-Joachim: *See*—
Philippson, Rainer; Hauser, Helmut; Gibian, Heinz; Kaspar, Emanuel; and Kessler, Hans-Joachim, 3,674,815.

Kessler, Lester A. Tool storage device. 3,674,155, Cl. 211-1.500.

Ketler, Albert E., Jr. Sea water battery with fiber-like metal cathode. 3,674,564, Cl. 136-100.00r.

Keur, Robert I.: *See*—
Stone, J. James, Jr.; Madden, Thomas J., Jr.; Gerlach, Glendon T.; and Keur, Robert I., 3,673,936.

KEV Electronics Corporation: *See*—
Harrison, Stanley, 3,675,061.

Keystone Consolidated Industries, Inc.: *See*—
Schill, John M., 3,674,329.

Khan, Aziz Urrehman: *See*—
Sweeney, Richard F.; Khan, Aziz Urrehman; Price, Alson K.; Jones, Edward Stephen; and Otto, Julian A., 3,674,800.

Khelghatian, Habet M.; and Poppe, Wassily, to Avisun Corporation. Metallized polyolefin compositions containing courmarone-indene resins and method of preparing. 3,674,536, Cl. 117-47.00a.

Khlopin, Mikhail Ivanovich: *See*—
Zykov, Vladimir Pavlovich; Panov, Alexei Alexandrovich; Prudnikov, Pavel Alexeevich; Khlopin, Mikhail Ivanovich; and Shlyapnikov, Alexel Dmitrievich, 3,675,087.

Kida, Kazuyoshi: *See*—
Hosono, Shinichi; and Kida, Kazuyoshi, 3,674,057.

Kidde, Walter, & Company, Inc.: *See*—
Cirillo, John, 3,674,024.

Kiekhaefer, Elmer Carl. Snow vehicle anti-sway suspension system. 3,674,103, Cl. 180-5.00r.

Kienast, Gerhard: *See*—
Schnegg, Robert; Pelousek, Herbert; Dippolhofer, Robert; Wiegreffe, Wolfgang; Voelz, Hans-Georg; and Kienast, Gerhard, 3,674,747.

Kiess, Helmut Gustav, to RCA Corporation. Non air-polluting corona discharge devices. 3,675,096, Cl. 317-262.00a.

Kikkoman Shoyu Co., Ltd.: *See*—
Yokotsuka, Tamotsu; Hashimoto, Hikotaka; and Iwaasa, Takashi, 3,674,644.

Kimberly-Clark Corporation: *See*—
Bates, John D.; and Olson, Virginia A., 3,674,029.
Mattes, William J., 3,674,617.
Roeder, Robert J., 3,674,595.
Werner, Edward E.; and Wollangk, Edward G., 3,674,026.

Kimbrell, Sol B.: *See*—
Heilmayr, Peter F.; Kimbrell, Sol B.; and Giuffre, Joseph C., 3,674,388.

Kimura, Harutaka: *See*—
Iwasaki, Koichiro; Yamaguchi, Kazuo; Kimura, Harutaka; Hasuo, Masayoshi; and Tanaka, Toru, 3,674,764.

Kimura, Takashi; Majima, Azusa; Hamamoto, Hiroshi; and Awano, Yoji, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Method for producing iron base sintered alloys containing copper. 3,674,472, Cl. 75-221.000.

Kinberg, Benjamin: *See*—
Mayer, Richard J.; and Kinberg, Benjamin, 3,674,598.

Kindell, Colin David, to AMP Incorporated, mesne. Heat seal retaining clips. 3,673,643, Cl. 24-73.00b.

Kindell, Colin David; and Raynor, Terence Robert. Staking machine. 3,673,665, Cl. 29-203.00d.

Kindler, Hubert: *See*—
Baumgartner, Siegfried; Kindler, Hubert; Lidl, Rolf; and Boden, Henrich, 3,674,398.

King Company, Inc.: *See*—
Grinde, Jon W., 3,674,161.

King, Henry L.: *See*—
Ridgway, James S.; King, Henry L.; and Pickett, Oscar A., Jr., 3,674,752.

King, Laurence F., to Esso Research and Engineering Company. Polyvinyl chloride composition. 3,674,730, Cl. 260-23.0xa.

King, William: *See*—
Brown, Robert H.; Anderson, William A.; and King, William, 3,674,448.

Kingslow, William G., Jr., to Phillips Petroleum Company. Container labeling apparatus with gaseous airjet means. 3,674,606, Cl. 156-497.000.

Kinner, George Henry: *See*—
Giltrow, Jeremy Peter; Kinner, George Henry; and Lancaster, John Keith, 3,674,689.

Kirk, Colin John, to Martonair Limited. Magnetically operable device. 3,675,171, Cl. 335-232.000.

Kirk, Mahlon Randall, to Scott Paper Company. Paper coating composition coagulatable by heating. 3,674,726, Cl. 260-17.4st.

Kirkham, Arthur J. Clamping telescopic tubes. 3,674,294, Cl. 287-58.0ct.

Kirkham, Jackie L.; and Jones, Warren E. Converter for a toll verification system. 3,674,992, Cl. 235-92.0tc.

Kish, George R.; and Swanson, Kenneth B., to Midland-Ross Corporation. Pressure responsive mechanism. 3,674,954, Cl. 200-82.00d.

Kisling, James W., III, to Schlumberger Technology Corporation. Methods and apparatus for completing production wells. 3,674,091, Cl. 166-314.000.

Kitrilakis, Sotiris S., to Tecna Corporation. Oxygenator. 3,674,440, Cl. 23-258.500.

Klaue, Hermann. Full disc brake with rotating brake discs. 3,674,118, Cl. 188-72.2.

Kleer-Vu Industries, Inc.: *See*—
Bristol, Thomas R.; Lakin, Harold; and Renga, Fred L., 3,674,142.

Klein, Norman E., to Deering Milliken Research Corporation. Method and apparatus for positioning a continuous thread or cord on a support surface. 3,674,584, Cl. 156-173.000.

Klimek, Norbert: *See*—
Huber, Manfred; Klimek, Norbert; and Dee, Kenneth Herbert William, 3,673,956.

Klimisch, Richard L., to General Motors Corporation. Catalyst for nitrogen oxide reduction. 3,674,423, Cl. 23-2.00e.

Kline, John C.; and Kronman, Albert F., to Eclipse Sleep Products, Inc. Trapazoidal stabilizers for inner spring units. 3,673,619, Cl. 5-260.000.

Klingbeil, William G. Means for making shoe lasts. 3,674,063, Cl. 142-1.000.

Klockenbrink, Joseph M.; and Aydin, Kemal, to Path Computer Equipment Inc. Lamp triggering circuit. 3,675,076, Cl. 315-200.00r.

Klyamkin, Semen Solomonovich; and Kraichik, Jury Solomonovich. Direct-current power transmission line. 3,675,082, Cl. 317-20.000.

Knapsack Aktiengesellschaft: *See*—
Vogt, Wilhelm; Sennewald, Kurt; and Glaser, Hermann, 3,674,839.

Knechtel, Wilhelm Josef; and Schaffer, Detlef, to Canon Kabushiki Kaisha, mesne. Electrical charging device. 3,675,010, Cl. 250-49.5zc.

Knobloch, Ronald E.: *See*—
Doonan, Wendell M.; and Knobloch, Ronald E., 3,674,303.

Knowles, Denis: *See*—
Jacobson, Sydney; Knowles, Denis; and Parker, Derek, 3,674,592.

Knut Arne Erik Rehnstrom: *See*—
Fluhr, Nils Allan, 3,673,927.

Knutson, Carroll F.; and Boardman, Charles Robert, to CER Geonuclear Corporation. Method for effecting directional nuclear fracturing. 3,674,313, Cl. 299-13.000.

Kobayashi, Seihin; Torii, Michihiro; and Yamakawa, Fujio, to Fuji Denki Kagaku Kabushiki Kaisha. Frame structure for magnetic memory planes. 3,675,222, Cl. 340-174.0ma.

Kobayashi, Seihin; Torii, Michihiro; and Suzuki, Koichiro, to Fuji Denki Kagaku Kabushiki Kaisha. Magnetic memory plane. 3,675,223, Cl. 340-174.00s.

Kobayashi, Yoshinobu: *See*—
Kurauchi, Noritaka; Tada, Shotaro; Shima, Hiroshi; Hiraoka, Susumu; Nagao, Taichiro; Koyama, Masahiro; Shiraishi, Satoshi; Shindo, Masuo; and Kobayashi, Yoshinobu, 3,674,990.

Kock, Erhard, to Champion Spark Plug Company. Multiple color paint spray system. 3,674,205, Cl. 239-1.000.

Kocsis, Joseph; and Cauge, Thomas Peter, to Signetics Corporation. Surface controlled avalanche semiconductor device. 3,675,092, Cl. 317-235.00r.

Koehler, Albert T.; Shideler, Paul J.; and Dohogne, Linus E., to Gerrard, A. J., & Company. Automatic cotton bale transfer apparatus. 3,673,950, Cl. 100-7.000.

Koehler-Dayton, Inc.: *See*—
Miller, Merlin S.; and Russo, Ronald D., 3,674,148.

Koepnick, Paul J.: *See*—
Arganbright, Ned H.; Koepnick, Paul J.; Nelson Carl T.; and O'Brien, Arthur F., 3,673,949.

Kogelnik, Herwig Werner, to Bell Telephone Laboratories, Incorporated. Hologram generator using superposition of plane waves. 3,674,332, Cl. 350-3.500.

Kogelnik, Herwig Werner, to Bell Telephone Laboratories, Incorporated. Light wave coupling into thin film light guides with Bragg type gratings. 3,674,336, Cl. 350-96.0wg.

Kohashi, Tadao, to Matsushita Electric Industrial Co., Ltd. Energy responsive image conversion and amplification device. 3,675,075, Cl. 315-169.000.

Kohler, George O.: *See*—
Hoover, Richard D.; and Kohler, George O., 3,674,770.

Kohler, Roland; Nagel, Erich; Hujer, Friedrich; and Viehrig, Wolfgang, to Agfa-Gevaert Aktiengesellschaft. Photographic printing apparatus. 3,674,365, Cl. 355-40.000.

Koide, Tsuyoshi; and Othu, Ikuo, to Toyoda Koki Kaisha, t/a Toyoda Machine Works. Apparatus for preventing circumferential overspeeding of grinding wheel. 3,673,741, Cl. 51-134.50r.

Kokusai Denshin Denwa Kabushiki Kaisha: *See*—
Yanagidaira, Hidetaka; Kawai, Kazuo; and Shintani, Sotokichi, 3,674,996.

Koll, Robert J.: *See*—
Lukes, James J.; and Koll, Robert J., 3,674,881.

Kollars, Harold R.: *See*—
Jezuit, Leslie J.; and Kollars, Harold R., 3,673,959.

Kolpek, Robert A., to International Business Machines Corporation. Data system with printing, composing communications, and magnetic card processing facilities. 3,674,125, Cl. 197-19.000.

Komander, Alfons Anzelm, to Imperial Chemical Industries Limited. Pigment compositions. 3,674,527, Cl. 106-289.000.

Komatsu, Youji,; Furukawa, Yauhiro; and Yokomizo, Takashi, to Maruzen Oil Company Limited. Method of preventing double bond migration of mono-olefinic hydrocarbons in selective hydrogenation. 3,674,886, Cl. 260-677.00h.

Komori, Ryozo: *See*—
Seko, Maomi; Ogawa, Shinsaku; Komori, Ryozo; Asuma, Masaro; Isoya, Toshiro; and Sakai, Takamasa, 3,674,653.

Komuro, Toshio: *See*—
Tanaka, Katsunobu; Nara, Takashi; Misawa, Masanaru; and Komuro, Toshio, 3,674,641.

Kondelikova, Jaroslava: *See*—
Kralicek, Jaroslav; Kubanek, Vladimir; Solcova, Jitka; and Kondelikova, Jaroslava, 3,674,751.

Kondo, Tokiharu: *See*—
Iijima, Yoo; Shimamura, Isao; Kondo, Tokiharu; and Haruhike, Iwano, 3,674,491.

Kondo, Yoshihiro: *See*—
Ichiki, Eiichi; Iida, Kazuo; Inoue, Yasuhiko; and Kondo, Yoshihiro, 3,674,541.

Konecny, Jan; Haas, Jan T.; and Groenewald, Hans E., to Hamburger Flugzeugbau GmbH. Fan-type aircraft and hot-gas structure therefor. 3,674,224, Cl. 244-12.00b.

Konishi, Hiroshi: *See*—
Yamadai, Tadaaki; Kushida, Tadao; Konishi, Hiroshi; and Inaba, Yoshinari, 3,673,631.

Kono, Tteomi, to Minolta Camera Kabushiki Kaisha. Cutter device of rolled copy paper for electronic copying machines. 3,673,905, Cl. 83-175.000.

Koppers Company: *See*—
Carman, Kenneth K., 3,673,814.

Koppers Company, Inc.: *See*—
Wright, John, 3,673,813.

Korman, Nathaniel I., to Ventures Research & Development Group. Method and apparatus for evaluating color transparencies and the like. 3,674,364, Cl. 355-38.000.

Korner, Gerhard; Schmitz, Wolfgang; Dabringhausen, Friedhelm; and Gruber, Lothar, to Brown, Boveri & Cie Aktiengesellschaft. Gas blast switch. 3,674,957, Cl. 200-148.0bv.

Koster, Klaus, to Mount Hope Machinery Company. Sheet guiding and opening apparatus. 3,673,647, Cl. 26-54.000.

Kostylev, Alexandr Dmitrievich; Gurkov, Konstantin Stepanovich; Tkach, Khaim Berkovich; and Lipovetsky, Lazar Moiseevich, to Institut Gornogo Dela Siberskogo otdelenia Akademii Nauk SSSR. Device for making holes in the ground. 3,674,099, Cl. 175-20.000.

Kovac, Zlata. Electroless codeposition of nickel alloys. 3,674,516, Cl. 106-1.000.

Kovacevic, Radoslav. Digital clock mechanism. 3,673,787, Cl. 58-50.00r.

Koyama, Masahiro: *See*—
Kurauchi, Noritaka; Tada, Shotaro; Shima, Hiroshi; Hiraoka, Susumu; Nagao, Taichiro; Koyama, Masahiro; Shiraishi, Satoshi; Shindo, Masuo; and Kobayashi, Yoshinobu, 3,674,990.

Kraemer, Nancy: *See*—
Aszalos, Adorjan; Robison, Robert S.; Kraemer, Nancy; Henshaw, Jo Ann; and Giannini, Mary Suzanne, 3,674,867.

Krage, Paul W.: *See*—
Scarnato, Thomas J.; Gordon, Paul C.; Hunter, Stephen R.; Krage, Paul W.; and Zablocki, Richard A., 3,673,779.

Kraichik, Jury Solomonovich: *See*—
Klyamkin, Semen Solomonovich; and Kraichik, Jury Solomonovich, 3,675,082.

Kralicek, Jaroslav; Kubanek, Vladimir; Solcova, Jitka; and Kondelikova, Jaroslava, to Zavody Antonina Zapotockeho, narodni podnik. Method of manufacturing polyamides by alkaline polymerization of cyclic lactams. 3,674,751, Cl. 260-78.00l.

Krantz, Tore Samuel, to Telefonaktiebolaget L M Ericsson. Means for attaching a printed circuit card on a relay. 3,674,960, Cl. 200-168.00c.

Krauch, Carl Heinrich: *See—*
Hoffmann, Horst; Krauch, Carl Heinrich; Otto, Hans-Werner; and Volkert, Otto, 3,674,494.

Kraus, Gerard, to Phillips Petroleum Company. Carbon black blending in rubber. 3,675,009, Cl. 250-49.50r.

Krauss-Maffei Aktiengesellschaft: *See—*
Baumgartner, Siegfried; Kindler, Hubert; Lidl, Rolf; and Boden, Henrich, 3,674,398.
Baumgartner, Siegfried; Fries, Bernd; Lidl, Rolf; and Zippe, Gunter, 3,674,408.

Krawiec, Donald M.: *See—*
Anthony, Andrew J.; Gaines, Albert L.; and Krawiec, Donald M., 3,674,635.

Krebs, James Norton; and Kappus, Peter G., to General Electric Company. Fan engine with counter rotating geared core booster. 3,673,802, Cl. 60-226.

Krebs, Jimmie M., to Chicago Show Printing Company. Display assembly and element therefor. 3,674,156, Cl. 211-4.000.

Krejcirik, Jiri: *See—*
Havranek, Milan; Zouhar, Drahomir; Dusik, Josef; Kucera, Jaromir; and Krejcirik, Jiri, 3,673,818.

Krengel, Theodore H.; and Pool, Richard L., to Allied Tube & Conduit Corporation. Protective and supporting means for apparatus for continuously coating steel strip. 3,673,980, Cl. 118-6.000.

Kroeger, Jerry E., to Square D Company. Means for retaining a circuit breaker handle in on position while the circuit breaker contact arms are latched in off position. 3,674,962, Cl. 200-172.00a.

Kroes, Magdalena: *See—*
Richter, Gerhard; Kroes, Magdalena; and Frietzsche, Angelika, 3,674,710.

Kronman, Albert F.: *See—*
Kline, John C.; and Kronman, Albert F., 3,673,619.

Kropf, Frederic F., to Conveyor system for drive-in restaurants. 3,673,967, Cl. 104-88.000.

Krug, Charles C. Pull rope friction type exercising device. 3,674,261, Cl. 272-79.00a.

Kubanek, Vladimir: *See—*
Kralicek, Jaroslav; Kubanek, Vladimir; Solcova, Jitka; and Kondelikova, Jaroslava, 3,674,751.

Kubo, Keishi; and Sakai, Kiyoshi, to Kabushiki Kaisha Ricoh. Image-carrying film for use as an original for projection and its manufacturing method. 3,675,013, Cl. 250-65.00t.

Kubota, Tadao; and Ida, Keisuke, to Tokyo Shibaura Electric Co., Ltd. Hermetically sealed electric compressor. 3,674,382, Cl. 417-372.000.

Kucera, Jaromir: *See—*
Havranek, Milan; Zouhar, Drahomir; Dusik, Josef; Kucera, Jaromir; and Krejcirik, Jiri, 3,673,818.

Kuehl, Paul B., to General Motors Corporation. Turbocharged internal combustion engine. 3,673,798, Cl. 60-13.000.

Kuffer, Francois; and Strub, Dietrich. Check valve for drainage of fluid into the vascular system or into a body cavity for the treatment of hydrocephalus internus and externus. 3,674,050, Cl. 137-536.000.

Kugelfischer George Schafer & Co.: *See—*
Gassner, Hans, 3,673,897.

Kuhn, Heinz: *See—*
Stier, Otto; Kuhn, Heinz; and Vollmer, Udo, 3,674,083.

Kunke, Arthur; Reinhardt, Dieter; and Glass, Waldemar, to Huppe, Justin. Automatic control of venetian blinds in response to both heat and light being below respective threshold values. 3,675,023, Cl. 250-206.000.

Kunov assor. to: *See—*
Kunov, Hans, 3,673,979.

Kunov, Hans, said Kunov assor. to and Gordon, Peter L. Alcohol level indicator. 3,673,979, Cl. 116-129.000.

Kuntz, Leland E., to Honeywell Inc. Automatic slope controller. 3,674,094, Cl. 172-4.500.

Kurath, Paul, to Abbott Laboratories. Erythromycin derivatives. 3,674,773, Cl. 260-210.00e.

Kurauchi, Noritaka; Tada, Shotaro; Shima, Hiroshi; Hiraoka, Susumu; Nagao, Taichiro; Koyama, Masahiro; Shiraishi, Satoshi; Shindo, Masuo; and Kobayashi, Yoshinobu, to Sumitomo Electric Industries, Ltd. Moving object identification system. 3,674,990, Cl. 235-61.11e.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See—*
Washimi, Koichi; Kanbayashi, Masaaki; Kanai, Toshio; and Fujimori, Akihiro, 3,674,679.

Kurihara, Kazuo, to Kabushiki Kaisha Daini Seikosha. Day-date jumper spring in calendar watch. 3,673,788, Cl. 58-58.000.

Kurokawa, Junji; Arai, Fumiaki; and Usui, Noriyuki, to Ricoh Co., Ltd. Light-sensitive sheet for use in electrophotography. 3,674,474, Cl. 96-1.500.

Kushida, Tadao: *See—*
Yamadai, Tadaaki; Kushida, Tadao; Konishi, Hiroshi; and Inaba, Yoshinari, 3,673,631.

Kusunoki, Kikunobu: *See—*
Ninomiya, Shoichi; Sakai, Masaaki; Oka, Sakae; and Kusunoki, Kikunobu, 3,675,224.

Kuszaj, Alex Mark, to Jones & Laughlin Steel Corporation. Coupling arrangement. 3,673,816, Cl. 64-23.000.

Kyowa Hakko Kogyo Co., Ltd.: *See—*
Tanaka, Katsunobu; Nara, Takashi; Misawa, Masanaru; and Komuro, Toshio, 3,674,641.

Kyritsis, William T.: *See—*
Annis, Rupert E., Jr.; and Kyritsis, William T., 3,674,401.

La Barge, Robert G.; and Johnson, Gary L., to Dow Chemical Company, The. Preparation of benzoyl peroxide. 3,674,858, Cl. 260-610.00d.

La Montagne, Joseph W. Fish lure. 3,673,726, Cl. 43-42.110.

Labbaye, Louis; and Bernard, Georges, to Merlin Gerin, Societe Anonyme. Three phase electric switching system having rectifier shunted contacts. 3,675,079, Cl. 317-11.00a.

Lackey, Jerry G.: *See—*
Nelson, Melvin A.; Lackey, Jerry G.; and Davies, Terence J., 3,675,022.

Lacy, James G.; and Byrne, John V., to Braun, Anton. Electrical apparatus for initiating combustion in free piston engines. 3,673,999, Cl. 123-149.00h.

Lacy, M. L., Ltd.: *See—*
Lacy, Mount Lee, 3,674,344.

Lacy, Mount Lee, to Lacy, M. L., Ltd. Light energy absorbing and filtering device for a motorcycle helmet. 3,674,344, Cl. 350-312.000.

Ladin, Eli M.; Kegerise, Harry L.; and Adams, John S., to Federal-Mogul Corporation. Clutch release bearing. 3,674,357, Cl. 308-233.000.

Lagow, Richard J.: *See—*
Margrave, John L.; Badachhape, Ramachandra B.; Wood, James L.; and Lagow, Richard J., 3,674,432.

L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude: *See—*
Le Mounier, Jean, 3,674,213.

Lakin, Harold: *See—*
Bristol, Thomas R.; Lakin, Harold; and Renga, Fred L., 3,674,142.

Lala, Louis A., to Amole, Inc., mesne. Silk screening apparatus. 3,673,954, Cl. 101-40.000.

Laliberte, Norman U., to American Optical Corporation. Producing polarizing optical devices and product thereof. 3,674,587, Cl. 156-245.000.

L'Aluminium Francais: *See—*
Baumann, Bernard, 3,674,605.

Lambrechts, Jan Bernard, to Agfa-Gevaert. Method of recording and transferring design indicia. 3,674,588, Cl. 156-230.000.

Lamm, Bo Robert: *See—*
Brandstrom, Arne Elof; Carlsson, Per Arvid Emil; Carlsson, Stig Ake Ingemar; Corrodi, Hans Rudolf; Ek, Lars; Lamm, Bo Robert; and Ablad, Bengt Arne, 3,674,840.

Lancaster, John Keith: *See—*
Giltrow, Jeremy Peter; Kinner, George Henry; and Lancaster, John Keith, 3,674,689.

Lancor, Joseph H., Jr., to Bell & Howell Company. Audio-visual recording and display methods and apparatus. 3,674,346, Cl. 352-12.000.

Landry, Robert J.; and Snitzer, Elias, to American Optical Corporation. Sensitizing luminescence of erbium with molybdenum. 3,675,155, Cl. 331-94.500.

Landuyt, John F., to Illinois Tool Works Inc. Electronic drip timing device. 3,675,243, Cl. 340-384.00e.

Lane, Alan B., to Hunt-Wesson Foods, Inc. Process for cooking bacon and other meat products using infra-red and microwave energy. 3,674,504, Cl. 99-107.000.

Langdon, Thomas Edward. Electrical contact assembly having damping means. 3,674,968, Cl. 200-166.00h.

Lange, Wilfried: *See—*
Volkmann, Dieter; and Lange, Wilfried, 3,673,923.

Langella, Dominick W. Insulator with conductor piercing clamp for insulated cable. 3,674,916, Cl. 174-169.000.

Langer, Alfred: *See—*
Hanig, Siegfried; and Langer, Alfred, 3,673,806.

Langham, J. Michael. Digital variable frequency oscillator. 3,675,146, Cl. 331-1.00r.

Lanham, Betty U.: *See—*
Lankford, Barre D.; and Lanham, Charles W., 3,675,181.

Lanham, Charles W.: *See—*
Lankford, Barre D.; and Lanham, Charles W., 3,675,181.

Lankford, Barre D.; and Lanham, Charles W.; deceased (by Lanham, Betty U.; administratrix), to Entron, Inc. Coaxial connector means affording alternate 90° seizure. 3,675,181. Cl. 339-32.00r.

Lapkin, Milton: *See—*
Fuzesi, Stephen; and Lapkin, Milton, 3,674,717.

Larina, Anastasia Vasilievna: *See—*
Bokov, Jury Sergeevich; Vikulina, Ninel Vladimirovna; Dogadkin, Boris Aristarkhovich; Erofeev, Boris Vasilievich; Larina, Anastasia Vasilievna; Lavrischev, Vadim Petrovich; Markov, Vladimir Vladimirovich; Naumova, Sofia Fadeevna; Jurina, Olge Demidovna; and Yarovaya, Galina Dmitrievne, 3,674,496.

Larrinaga, John; and Jones, Charles, to Curtis-Wright Corporation. Fluid seal for piston of rotary piston mechanism. 3,674,384, Cl. 418-120.000.

Larsen, Eric R.; Keller, Albert Kent; and Plepys, Raymond A., to Dow Chemical Company, The. Method of preparing chloroacetyl chloride. 3,674,664, Cl. 204-158.00r.

Larsen, Ronald L., to Conwed Corporation. Method for bias cutting a tubular net. 3,674,898, Cl. 264-146.000.

Larson, Leward M.: *See—*
Drown, George C., 3,675,198.
Larsson, Bertil Ivar Torsten. Lifting device. 3,674,240, Cl. 254-95.000.
Lassman, Benjamin, to Lassman, Benjamin & Son, Inc. Solid press molding apparatus. 3,674,406, Cl. 425-353.000.
Lassman, Benjamin & Son, Inc.: *See—*
Lassman, Benjamin, 3,674,406.
Lastochkin, Rostislav Ivanovich, deceased: *See—*
Sidorov, Oleg Pavlovich; Ryabtsev, Pavel Sergeevich; Lastochkin, Rostislav Ivanovich, deceased; Lastochkina, Nadezhda Andreevna; and Lastochkina, Tatyana Rostislavovna, 3,675,102.
Lastochkina, Nadezhda Andreevna: *See—*
Sidorov, Oleg Pavlovich; Ryabtsev, Pavel Sergeevich; Lastochkin, Rostislav Ivanovich, deceased; Lastochkina, Nadezhda Andreevna; and Lastochkina, Tatyana Rostislavovna, 3,675,102.
Lastochkina, Tatyana Rostislavovna: *See—*
Sidorov, Oleg Pavlovich; Ryabtsev, Pavel Sergeevich; Lastochkin, Rostislav Ivanovich, deceased; Lastochkina, Nadezhda Andreevna; and Lastochkina, Tatyana Rostislavovna, 3,675,102.
Latschbacher, Kajetan. Wood marking tags. 3,673,717, Cl. 40-2.000.
Laue, Hans-Jurgen Rainer; Bohm, Horst Otto; and Reddemann, Bernhard Hermann, to Metallgesellschaft Aktiengesellschaft. Vanadium base alloys containing niobium and titanium. 3,674,470, Cl. 75-134.00v.
Lavender, John F., to Lilly, Eli, and Company. Live attenuated rabies virus vaccine and process therefor. 3,674,862, Cl. 424-89.000.
Lavigne, Pierre. Composite moisture-tight structure of absorbent tissue bonded to an impermeable thermoplastic material. 3,674,613, Cl. 161-37.000.
Lavigne, Pierre, to Commissariat a l'Energie Atomique. Heat-to-electric power converter. 3,675,031, Cl. 290-1.000.
Lavis, Walter J. Removable cover for spray gun. 3,674,074, Cl. 150-52.00p.
Lavrischev, Vadim Petrovich: *See—*
Bokov, Jury Sergeevich; Vikulina, Ninel Vladimirovna; Dogadkin, Boris Aristarkhovich; Erofeev, Boris Vasilievich; Larina, Anastasia Vasilievna; Lavrischev, Vadim Petrovich; Markov, Vladimir Vladimirovich; Naumova, Sofia Fadeevna; Jurina, Olge Demidovna; and Yarovaya, Galina Dmitrievne, 3,674,496.
Law, John H., to United States of America, Health, Education and Welfare. Synthesis of a material with juvenile hormone activity. 3,674,818, Cl. 260-408.000.
Lawrence, Thomas Russell, to Bell Telephone Laboratories, Incorporated. Digital circuit demodulator for frequency-shift data signals. 3,674,935, Cl. 178-88.000.
Lazar, Burton A.; Bell, Randall P.; and Vanderhoef, John P., to Intercraft Industries Corporation. Interconnected hanging picture frames. 3,673,723, Cl. 40-152.100.
Lazarow, Seldan A.: *See—*
Curtiss, Robert H.; Holzman, Richard; and Lazarow, Seldan A., 3,673,955.
Lazzarotti, Sebastion James: *See—*
Hunter, James R.; Lazzarotti, Sebastion James; and Mann, Abe, 3,674,143.
Le Beck, Norman G.: *See—*
Marks, Joseph D.; Le Beck, Norman G.; and Allen, Glenn L., 3,674,181.
Le Mounier, Jean, to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude. Cutting head for thermochemical machining. 3,674,213, Cl. 239-425.000.
Le Page, Jean Francois: *See—*
Derrien, Michel; and Le Page, Jean Francois, 3,674,888.
Leahy, Thomas E., Jr.: *See—*
Rose, Henry J.; Turbak, Albin F.; and Leahy, Thomas E., Jr., 3,674,511.
Leaman, Frank H. Platinized plastic electrodes. 3,674,675, Cl. 204-290.00r.
Lean, Eric G.: *See—*
Fang, Frank F.; and Lean, Eric G., 3,675,140.
Harris, Erik P.; Lean, Eric G.; and Powell, Carl G., 3,675,150.
Lear Siegler, Inc.: *See—*
Daniel, David W.; and Anthony, Russell W., 3,673,887.
Lebag Leitungs-und Elektrobau AG: *See—*
Vogeli, Rudolf, 3,674,116.
Lebkucher, Karl Heinz: *See—*
Schinzel, Erich; Pintschovius, Ulrich; and Lebkucher, Karl Heinz, 3,674,781.
Leblond, Jean, to Uniroyal Englebert France S.A. Method of building an annular breaker. 3,674,582, Cl. 156-133.000.
Leblond, Jean, to Uniroyal Engelbert France S.A. Expansible and contractible transfer ring. 3,674,603, Cl. 156-394.000.
Lebre, Charles Jean Pierre. Power or manual drive cable traction apparatus. 3,673,877, Cl. 74-37.000.
Lee, George A.: *See—*
Cristol, Stanley J.; and Lee, George A., 3,674,665.
Lee, Irvin J.: *See—*
Harris, Robert J.; and Lee, Irvin J., 3,674,546.
Lee, Richard J.: *See—*
Karll, Robert E.; and Lee, Richard J., 3,674,691.
Legler, Ernst, to Fernseh G.m.b.H. Method and arrangement for the transmission of synchronizing information to color television apparatus. 3,674,918, Cl. 178-5.20r.
Lehmann, William Lester, to RCA Corporation. Capacitors of constant capacitance. 3,675,095, Cl. 317-261.000.
Lehner, Bruce A.: *See—*
Hegenberger, John N., 3,673,730.
Leininger, Dale E.: *See—*
Whysong, Dale C.; Leininger, Dale E.; and Young, Herbert D., 3,674,559.
Leitz, Wilfried, to Ciba-Geigy AG. Method of applying pilfer-proof closures. 3,673,761, Cl. 53-42.000.
Lejeune, Daniel, to Compagnie Generale des Etablissements Michelin raison sociale Michelin & Cie. Cast steel wheels for heavy-duty vehicles. 3,674,315, Cl. 310-65.000.
Lejeune, Lloyd M. Apparatus for preventing offshore oil well pollution. 3,674,150, Cl. 210-245.000.
Lemelson, Jerome H., to Triax Company, The. Load handling mechanism and automatic storage system. 3,674,159, Cl. 214-16.40a.
Lenz, Henry George, to General Electric Company. Hermetically sealed dynamoelectric machine. 3,675,056, Cl. 310-54.000.
Leonard, Gerald D., to Research-Cottrell, Inc. Jacketed precipitator apparatus. 3,673,768, Cl. 55-135.000.
Lerman, Frank; and Bartsch, Raymond C., to National Distillers and Chemical Corporation. Process for the preparation of pigmented polymer powders of controlled particle shape and size and size distribution and product. 3,674,736, Cl. 260-41.00r.
Letarte, Frank M. Storm door glazing bead. 3,674,082, Cl. 166-371.000.
Leucci, Gino. Shield for endoscopic instruments. 3,674,016, Cl. 128-4.000.
Leutwein, Manfred: *See—*
Streicher, Heinz; Riek, Siegfried; and Leutwein, Manfred, 3,674,351.
Lever Brothers Company: *See—*
Osborne, David Richard Duke, 3,674,850.
Levin, Ezra, to VioBin Corporation, mesne. Method of producing fat and edible solids from biological material using vapor heated solvent. 3,674,657, Cl. 203-49.000.
Levington, Henry John; and Clark, Charles Keith, to Associated Engineering Limited. Heat exchangers. 3,673,846, Cl. 72-326.000.
Levy, Stanley P., to Pichel Industries, Inc. Electronic lamp driving circuit for hand held lamp. 3,675,078, Cl. 315-289.000.
Lewis, George E.: *See—*
Murman, Fernando; and Lewis, George E., 3,674,053.
Lewis, George E.; and Murman, Fernando, to Hydril Company. Pig diverter. 3,674,123, Cl. 193-23.000.
Lewis, Isabelle J. Bookholder. 3,674,231, Cl. 248-451.000.
Lewis, Philip J.: *See—*
Bice, John R.; and Lewis, Philip J., 3,674,510.
Lewis, Vera Gloria: *See—*
Francini, Joseph Pirra; Braxton, James Lopez, Jr.; Lewis, Vera Gloria; McPherson, Frank Henderson; Rosenberg, Daniel; and Sekse, Torkjell, 3,674,988.
Leyburn, Derek; Montague, Bernard R.; and Mattila, Henry K., to Bell Canada. Telephone translator apparatus. 3,674,940, Cl. 179-18.0et.
Leymarie, Claude P. H., to Merlin Gerin, Societe Anonyme. Connecting device for an electronic apparatus carrying panel. 3,674,949, Cl. 200-51.100.
Leyri, Claude, to Jaeger. Timekeeping devices. 3,673,786, Cl. 58-28.00a.
Lezhava, Gurami Semenovich: *See—*
Libkind, Mark Samuilovich; and Lezhava, Gurami Semenovich, 3,675,119.
Liautaud, Philip J., to Fendal Company. Resilient headband for spectacles. 3,673,610, Cl. 2-14.00v.
Libbey-Owens-Ford Company: *See—*
Beckham, Robert R.; Walters, Emmett L.; Brown, Jack G.; De Rose, Kenneth M.; and Ryan, Joseph D., 3,673,981.
Niese, William F., 3,673,664.
Swillinger, Francis L., 3,674,456.
Welker, Robert H.; and Halmbrecht, William L., 3,673,737.
Libkind, Mark Samuilovich; and Lezhava, Gurami Semenovich. Twin reactor employed for voltage stabilization in power plants. 3,675,119, Cl. 323-48.000.
Lidl, Rolf: *See—*
Baumgartner, Siegfried; Kindler, Hubert; Lidl, Rolf; and Boden, Henrich, 3,674,398.
Baumgartner, Siegfried; Fries, Bernd; Lidl, Rolf; and Zippe, Gunter, 3,674,408.
Liebe, Werner: *See—*
von Konig, Anita; Liebe, Werner; and Timmler, Helmut, 3,674,481.
Lieberman, Jan Mark: *See—*
Judd, Frank Fuller; Lieberman, Jan Mark; and Wilhart, Helmut, 3,675,159.
Liedberg, Kurt Herman, to Atlas Copco Aktiebolag. Spray gun. 3,674,209, Cl. 239-143.000.
Lieder, Gaylerd M.: *See—*
Ayres, Richard H.; and Lieder, Gaylerd M., 3,673,759.
Lieffring, Gordon V. Vehicle wash apparatus. 3,673,626, Cl. 15-97.00r.
Liisberg, Sven: *See—*
Frey, Hans-Hasso; and Liisberg, Sven, 3,674,787.
Lilly, Eli, and Company: *See—*
Lavender, John F., 3,674,862.
Ludwig, Nelson H.; and White, William A., 3,674,869.
Spry, Douglas O., 3,674,775.
Webber, J. Alan, 3,674,784.
Williams, Robert H.; and Hoehn, Marvin M., 3,674,774.

Lilly Industries, Ltd.: *See*—
Evans, Delme, 3,674,871.

Lilly, Malcolm Douglas; Kay, Garth, and; Wilson, Richard John Hugh; and Sharp, Alister Kimball, to National Research Development Corporation. Novel polymeric materials containing triazinyl groups. 3,674,767, Cl. 260-89.100.

Lincoln, Andrew J.; and Menger, Karl S., to Sperry Rand Corporation. Apparatus for arithmetic operations by alerting the corresponding digits of the operands. 3,675,000, Cl. 235-168.000.

Linde Aktiengesellschaft: *See*—
Weiche, Hans-Joachim, 3,674,031.

Lindelow, Claes-Goran: *See*—
Mattsson, Mats Erik; Eriksson, Bjorn Sven Hilding; and Lindelow, Claes-Goran, 3,674,199.

Lindner, Ernst: *See*—
Stache, Ulrich; Radscheit, Kurt; Fritsch, Werner; Haede, Werner; and Lindner, Ernst, 3,674,779.

Lindner, Fritz; Wallhausser, Karl Heinz; and Huber, Gerhard, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Moenomycin and process for producing same. 3,674,866, Cl. 424-118.000.

Lindsay, George F.; and Whitehouse, Harper John, to United States of America, Navy. Field-delineated acoustic wave device. 3,675,052, Cl. 310-8.100.

Line, George Harry: *See*—
Dodd, John Alton, Jr.; and Line, George Harry, 3,674,488.

Lines, Jerry J. Convertible snowblower and lawn rake. 3,673,715, Cl. 37-43.00e.

Linne, William F.: *See*—
Weick, Louis F.; and Linne, William F., 3,673,796.

Lintz, Ervin E. Fishing float. 3,673,729, Cl. 43-43.110.

Liotta, Lance A. Aerial toy. 3,673,732, Cl. 46-74.00d.

Lipe Corporation: *See*—
Mead, Dennis E., 3,674,128.

Lipovetsky, Lazar Moiseevich: *See*—
Kostylev, Alexandr Dmitrievich; Gurkov, Konstantin Stepanovich; Tkach, Khaim Berkovich; and Lipovetsky, Lazar Moiseevich, 3,674,099.

List, Herbert A., to List Industries Inc. Locking mechanism for portable gate. 3,674,081, Cl. 160-161.000.

List Industries Inc.: *See*—
List, Herbert A., 3,674,081.

Little, Arthur D., Inc.: *See*—
Milgrom, Jack, 3,674,486.

Little, Arthur D., Inc., mesne: *See*—
Papanastassion, Zion B.; and Neumeyer, John L., 3,674,809.

Littlepage, Gertrude S. Wood coating composition comprising cholesterol, glyceride oil or squalene and a liquid fatty acid. 3,674,524, Cl. 106-243.000.

Litton Business Systems, Inc.: *See*—
Benson, William G., 3,674,943.

Livermore, Frederick C.; and Neathway, Graham Albert, to Northern Electric Company Limited. Thin-film resistor anodization. 3,674,659, Cl. 204-56.00r.

Lock, Everett H.; and Heilhecker, Joe K., to Esso Production Research Company. Method for forming tool assembly. 3,673,676, Cl. 29-473.100.

Locke, Frank W., to Hoerner Waldorf Corporation. Display tray. 3,674,133, Cl. 206-44.000.

Lockheed Aircraft Corporation: *See*—
Adams, Robert H., 3,675,141.
Goldberg, Leonard Z., 3,674,291.

Loewe Opta GmbH: *See*—
Dennewitz, Rolf Dictor, 3,675,074.

Loewen, Bruno F.: *See*—
Austin, Oliver K.; and Loewen, Bruno F., 3,674,437.

Loewenstein, Paul; and Gorecki, Thomas A., to Whittaker Corporation. Method for producing complex shapes by filled billet extrusion. 3,673,667, Cl. 29-423.000.

Lohneis, Earl R.: *See*—
Zankl, Frank; and Lohneis, Earl R., 3,674,323.

Lohr, Thomas E., to Allied Chemical Corporation. Vehicle safety assembly. 3,674,284, Cl. 280-150.0ab.

Lohse, Friedrich; Schmid, Rolf; Fisch, Willy; and Batzer, Hans, to Ciba Limited. High crystalline transition temperature elastomers from polyester polyurethanes. 3,674,746, Cl. 260-75.0np.

Lombardino, Joseph G.; and Holland, Gerald F., to Pfizer Inc. Benzothiazine dioxides as lipid regulating agents. 3,674,876, Cl. 424-246.000.

Long, Anthony Alfred Walter; and Nayler, John Herbert Charles, to Beecham Group Limited. p-Hydroxyampicillin and salts thereof. 3,674,776, Cl. 260-239.100.

Long, Clarice Cleland: *See*—
Long, J. Burton, 3,675,226.

Long, Eric L., to Cherry Electrical Products Corporation. Tilt switch with elongated switch blade mounted on a triangular pivot for wiping action. 3,674,966, Cl. 200-164.000.

Long, J. Burton; deceased (by Long, Clarice Cleland; executrix). Radio remote control for a slide projector. 3,675,226, Cl. 343-225.000.

Longi, Paolo: *See*—
Cameli, Nazzareno; Longi, Paolo; and Valvassori, Alberto, 3,674,754.

Loomis, Joseph W.: *See*—
Hegenberger, John N., 3,673,730.

Loqvist, Kaj R., to Fagersta Bruks Aktiebolag. Method for brazing dissimilar metals and composite articles produced thereby. 3,673,677, Cl. 29-473.100.

Lorber, Kurt. Paper clips. 3,673,641, Cl. 24-67.900.

l'Oreal: *See*—
Kalopissis, Gregoire; Gascon, Jean; Gallien, Jacqueline; Bugaut, Andree; and Gaston-Breton, Hubert, 3,674,414.
Morane, Bruno P., 3,674,180.

Loseke, Doris V. Riding capsule and the like. 3,674,260, Cl. 272-1.00r.

Loss, Michael. Cassette receptacle. 3,674,132, Cl. 206-1.00r.

Lougher, George B., III: *See*—
Abraham, Bruce C.; Fegley, Charles R.; and Lougher, George B., III, 3,674,141.

Loukes, David Gordon; and Edwards, Alan, to Pilkington Brothers Limited. Production of float glass having an oxidized metal-modified surface. 3,674,453, Cl. 04/26/72.

Louthan, Rector P., to Phillips Petroleum Company. Plasticized sulfur compositions. 3,674,525, Cl. 106-287.0sc.

Lovens Kemiske Fabrik Produktionsaktieselskab: *See*—
Frey, Hans-Hasso; and Liisberg, Sven, 3,674,787.

Lubrifiants: *See*—
Derrien, Michel; and Le Page, Jean Francois, 3,674,888.

Lucci, Donald E., to International Rubber Industries, Inc. Method of making blind joints for precise positioning of members. 3,674,068, Cl. 144-309.00l.

Lucifer S.A.: *See*—
Stampfli, Harald, 3,675,040.

Lucker, Jan Anna Antonius: *See*—
Arts, Mathieu Gerardus Henricus; Lucker, Jan Anna Antonius; and Groenenboom, Maarten, 3,674,674.

Ludemann, Ingo, to Nippon Gakki Seizo Kabushiki Kaisha. Piano sounding board assembly. 3,674,908, Cl. 84-212.000.

Ludlow Corporation: *See*—
Manasian, Arthur E.; Papenfuss, Carl J.; and Piekarski, William F., 3,674,139.

Ludwig, Nelson H.; and White, William A., to Lilly, Eli, and Company. Compositions for stabilizing trans-diethylstilbestrol. 3,674,869, Cl. 424-175.000.

Luedicke, Eduard; and Silver, Robert Steven, to RCA Corporation. Method of operating an information storage tube. 3,675,134, Cl. 328-124.000.

Lugo, Luigi: *See*—
Reni, Cesare; Gualdi, Giorgio; and Lugo, Luigi, 3,674,845.

Lukens Steel Company: *See*—
Bintzer, William W., 3,674,903.

Lukes, James J.; and Koll, Robert J., to Diamond Shamrock Corporation. Integrated process for the production of chlorinated hydrocarbons. 3,674,881, Cl. 260-654.00h.

Luksas, Anthony J.: *See*—
Kasik, Robert L.; and Luksas, Anthony J., 3,674,508.

Lyde, Derek Martin, to Albright & Wilson Limited. Electrodeposition of copper. 3,674,660, Cl. 204-52.00r.

Lyerly, William M.: *See*—
Cattermole, George R.; Cummings, Austin M.; and Lyerly, William M., 3,674,578.

Lyon, Richard K., to Esso Research and Engineering Company. Process for isomerizing hydrocarbons by use of high pressures. 3,674,681, Cl. 208-141.000.

Lyons, Richard J.; and Dabrowski, Jan, to United Merchants and Manufacturers, Inc. Textile spray composition. 3,674,418, Cl. 8-116.300.

Macdonald, Howard R., to Rohr Corporation. Method and apparatus for suppressing the noise of a fan-jet engine. 3,673,803, Cl. 60-226.00r.

Macgregor, Peter Stevens, to Flight Refuelling Limited. Air-to-air refuelling hose reels. 3,674,049, Cl. 137-355.200.

Machinery and Gears Hansen: *See*—
Hensen, David, 3,673,885.

Mack, Michael E., to United Aircraft Corporation. Superradiant traveling-wave dye laser. 3,675,151, Cl. 331-94.500.

MacKenzie, Gerald L.; and Mosher, Paul R., to United States of America, Navy. Hydrogen gas generating composition and method for the same. 3,674,702, Cl. 252-188.000.

Madden, Thomas J., Jr.: *See*—
Stone, J. James, Jr.; Madden, Thomas J., Jr.; Gerlach, Glendon T.; and Keur, Robert I., 3,673,936.

Mader, Peter Ernst. Lining device. 3,673,937, Cl. 95-12.000.

Magnaflux Corporation: *See*—
Flaherty, John J.; and Nerwin, Henry N., 3,673,860.

Magnepan Incorporated: *See*—
Winey, James M., 3,674,946.

Magnotto, Frank A. Instrument for marking pipe insulation for miter cuts. 3,673,689, Cl. 33-75.00r.

Mahoney, Michael. Universal screwdriver. 3,674,070, Cl. 145-50.00a.

Maier, Robert E., Jr.; and Moser, James R., to Harris-Intertype Corporation. Method and apparatus for feeding stacked sheet material. 3,674,258, Cl. 271-77.000.

Majima, Azusa: *See*—
Kimura, Takashi; Majima, Azusa; Hamamoto, Hiroshi; and Awano, Yoji, 3,674,472.

Makabe, Kazuo, to Daiichi Yakuhin Sangyo Kabushiki Kaisha. Compound of germanic acid and cysteine. 3,674,823, Cl. 260-429.00r.

Makarov, Valery Nikolaevich: *See*—

Voitsekhovsky, Bogdan Vyacheslavovich; Zuev, Alfred Alexandrovich; Plaxin, Vladimir Nikolaevich; and Makarov, Valery Nikolaevich, 3,673,849.
Malden, Peter James, to English Clays Lovering Pochin & Company Limited. Bleaching of clays. 3,674,558, Cl. 134-2.000.
Maley, Gerald A.: *See*—
Bossen, Douglas C.; Henle, Robert A.; Hsiao, Mu Y.; Maley, Gerald A.; and Pricer, W. David, 3,675,200.
Mallinckrodt Chemical Works: *See*—
Betz, Norman L.; and Stepaniuk, Nickolas J., 3,674,501.
Mallory, Glenn O., to Allied Research Products, Inc. Method of electroless deposition of a substrate and sensitizing solution therefor. 3,674,550, Cl. 117-212.000.
Mallory, P. R., & Co., Inc.: *See*—
Haarbye, Fredrik O.; and Murphy, Peter C., 3,674,446.
Manaka, Nobuzi: *See*—
Aono, Shigeo; Manaka, Nobuzi; and Inagaki, Tokuichi, 3,673,989.
Manasian, Arthur E.; Papenfuss, Carl J.; and Piekarski, William F., to Ludlow Corporation. Cotton bale cover. 3,674,139, Cl. 206-83.500.
Mandel, Mark. Rainbow kaleidoscope. 3,674,333, Cl. 350-5.000.
Mangin, Jean-Pierre, to Regie Nationale des Usines Renault and Automobiles Peugeot. Induction air temperature regulators. 3,673,995, Cl. 123-122.00d.
Mangold, James, to Societe Anonyme D.B.A. Hydraulic antiskid braking system. 3,674,317, Cl. 303-21.00f.
Manion, Jean P.; and Davies, Daniel J., to Allis-Chalmers Manufacturing Company. Process for increasing water repellency of cotton cloth. 3,674,667, Cl. 204-165.000.
Manjikian, Serop, to Universal Water Corporation. Reverse osmosis test cell. 3,674,152, Cl. 210-321.000.
Manka, Dan Paul, to Jones & Laughlin Steel Corporation. Method of operating gas analysis apparatus. 3,673,854, Cl. 73-23.000.
Mann, Abe: *See*—
Hunter, James R.; Lazzarotti, Sebastion James; and Mann, Abe, 3,674,143.
Mann, Robert C. Ankle support providing high bracing strength. 3,674,023, Cl. 128-166.000.
Mannesmann Aktiengesellschaft: *See*—
Petersen, Ulrich; and Grandin, Friedrich-Hans, 3,673,836.
Manning, Virgil B. Educational apparatus. 3,673,707, Cl. 35-35.00d.
Manoogian, Alex; and Pullen, Eric V., to Masco Corporation. Mixing valve. 3,674,048, Cl. 137-270.000.
Manufacture des Montres Rolex S.A.: *See*—
Gasser, Francois W.; and Girard, Pierre L., 3,673,790.
Manufacture Quenot Mabo: *See*—
Quenot, Andre, 3,673,692.
Mapes, Robert S.: *See*—
Dewey, Raymond D.; Mapes, Robert S.; and Jones, Garth S., 3,674,926.
Marand, Jean, to Ciba-Geigy Corporation. One piece coupler-aspirator-nozzle. 3,674,212, Cl. 239-308.000.
Marathon Oil Company: *See*—
Oleszko, Thaddeus J.; and Walker, Lynn P., 3,674,890.
Marcatili, Enrique Alfredo Jose, to Bell Telephone Laboratories, Incorporated. Beam coupling to and from thin film waveguide. 3,674,337, Cl. 350-96.0wg.
Marchiorello, Giovanni, to Inpat Establishment. Device for operating sliding doors. 3,673,736, Cl. 49-235.000.
Maremont Corporation: *See*—
McNally, Sellers B., 3,674,290.
Merck, James K., 3,673,780.
Margrave, John L.; Badachhape, Ramachandra B.; Wood, James L.; and Lagow, Richard J., to R. I. Patents, Inc. Superstoichlometric carbon monofluoride and methods for preparing stable carbon monofluorides of various stoichlometries. 3,674,432, Cl. 23-205.000.
Marion Laboratories, Inc.: *See*—
Mathison, Ian William, 3,674,791.
Markov, Vladimir Vladimirovich: *See*—
Bokov, Jury Sergeevich; Vikulina, Ninel Vladimirovna; Dogadkin, Boris Aristarkhovich; Erofeev, Boris Vasilievich; Larina, Anastasia Vasilievna; Lavrischev, Vadim Petrovich; Markov, Vladimir Vladimirovich; Naumova, Sofia Fadeevna; Jurina, Olge Demidovna; and Yarovaya, Galina Dmitrievne, 3,674,496.
Marks, Joseph D.; Le Beck, Norman G.; and Allen, Glenn L. Syringe and holder. 3,674,181, Cl. 222-179.500.
Marlor, Guy A.: *See*—
Growald, Bert; Dahlquist, John A.; and Marlor, Guy A., 3,674,711.
Martin, Edwin J., Jr.: *See*—
Owen, James Neal; Moberly, Raymond Ronald; Martin, Edwin J., Jr.; Yamada, Akemichi; and Thomas, Edmund C., 3,675,162.
Martinsen, Lyle J., to Practical Innovations, Inc. Peeling citrus fruit. 3,674,503, Cl. 99-100.000.
Martonair Limited: *See*—
Kirk, Colin John, 3,675,171.
Maruzen Oil Company Limited: *See*—
Komatsu, Youji,; Furukawa, Yauhiro; and Yokomizo, Takashi, 3,674,886.
Maruzen Sewing Machine Co., Ltd.: *See*—
Grange, Kenneth H., 3,673,972.
Marvin Shafer Co., Inc.: *See*—
Budzak, Steve, 3,674,259.
Marzocchi, Alfred, to Owens-Corning Fiberglas Corporation. Polyester reinforced elastomers. 3,674,724, Cl. 260-3.000.
Maschinenfabrik zum Bruderhaus G.m.b.H.: *See*—
Moesser, Wilhelm, 3,674,194.
Masco Corporation: *See*—
Manoogian, Alex; and Pullen, Eric V., 3,674,048.
Maslovsky, Gennady Vasilievich: *See*—
Berlin, Zalman Leivikovich; Bagrov, Oleg Nikolaevich; Maslovsky, Gennady Vasilievich; Serkov, Anatoly Gavrilovich; and Yakimovich, Viktor Yakovlevich, 3,673,988.
Mason, John B.: *See*—
Jellison, Frank R.; Mason, John B.; and McQueen, Terry K., 3,674,283.
Mason, John H.: *See*—
Economy, James; Wohrer, Luis C.; and Mason, John H., 3,674,894.
Massachusetts Institute of Technology: *See*—
Merrill, Edward W.; and Wong, Patrick Seck-lai, 3,673,612.
Montt, Michael R., 3,674,930.
Wilson, David G., 3,673,966.
Massari, Bernard J. Apparatus for cutting indicia from tape. 3,673,953, Cl. 101-19.000.
Massarotti, Luigi, to Atomjuboll S.r.l. Carburetor for internal-combustion engine. 3,674,245, Cl. 261-28.000.
Massey-Ferguson Services N.V.: *See*—
Thomas, Alfred W., 3,674,106.
Matejec, Reinhart, to Agfa-Gevaert Aktiengesellschaft. Process for the production of photographic images. 3,674,490, Cl. 96-48.00r.
Mathison, Ian William, to Marion Laboratories, Inc. Benzamido 2 lower alkyl decahydroisoquinolines. 3,674,791, Cl. 260-287.
Matlock, Charles W.: *See*—
McCarthy, Robert P.; and Matlock, Charles W., 3,674,620.
Matson, Carl G. Conveyor cleaner with elastomer spring. 3,674,131, Cl. 198-230.000.
Matsubara, Mitio; Yagyu, Shigeyuki; and Takeuchi, Satoru, to Shikoku Kasei Koygo Company Limited. Method of making a material for forming a wall surface. 3,674,533, Cl. 117-27.000.
Matsushita Electric Industrial Co., Ltd.: *See*—
Hamano, Goro, 3,674,997.
Hozumi, Shiro; Hirai, Kenichi; Tanigawa, Yoshiyuki; Yoshida, Katuro; and Sugihara, Kanji, 3,673,666.
Kohashi, Tadao, 3,675,075.
Mifune, Hideo; and Tani, Kenroku, 3,675,053.
Nagasawa, Masahiro, 3,675,088.
Naomoto, Susumu; Kaneko, Tadataka; and Esaki, Hideya, 3,675,091.
Sugaya, Hiroshi; and Nasu, Takuya, 3,674,942.
Suzuki, Takashi, 3,674,538.
Yoshiyama, Masami; Sato, Teruo; and Takeda, Hitoshi, 3,674,928.
Matsushita Electronics Corporation: *See*—
Naomoto, Susumu; Kaneko, Tadataka; and Esaki, Hideya, 3,675,091.
Teramoto, Iwao; Iwasa, Hitoo; Miyai, Yukio; and Takeshima, Masumi, 3,675,161.
Mattel, Inc.: *See*—
de Gelder, Jacob; Baginski, Albert R.; and Miller, Anthony D., 3,674,271.
Mattes, William J., to Kimberly-Clark Corporation. Cosmetic wipe. 3,674,617, Cl. 161-62.000.
Mattila, Henry K.: *See*—
Leyburn, Derek; Montague, Bernard R.; and Mattila, Henry K., 3,674,940.
Mattsson, Mats Erik; Eriksson, Bjorn Sven Hilding; and Lindelow, Claes-Goran, to Svenska Dataregister AB. Keyboard control means. 3,674,199, Cl. 235-26.000.
Matzuk, Alexander R.: *See*—
Ruyle, William V.; Sarett, Lewis H.; and Matzuk, Alexander R., 3,674,870.
Maxwell, Hugh W. Photographic processing apparatus. 3,673,944, Cl. 95-89.00r.
Mayer, Dietmar: *See*—
Kampfer, Helmut; von Konig, Anita; Ranz, Erwin; von Rintelen, Harald; Mayer, Dietmar; and Sasse, Klaus, 3,674,479.
Kampfer, Helmut; Von Konig, Anita; Ranz, Erwin; von Ritelen, Harald; Mayer, Dietmar; and Sasse, Klaus, 3,674,480.
Mayer, Endre A.: *See*—
Millman, William V.; and Mayer, Endre A., 3,674,045.
Mayer, Endre A., to Bendix Corporation, The. Opposing control vortex valve. 3,674,044, Cl. 137-81.500.
Mayer, Richard J.; and Kinberg, Benjamin. Apparatus for producing a three-dimensional work of art. 3,674,598, Cl. 156-345.000.
Mayer Rolf; and Reitinger, Johann, to Universitat Stuttgart. Electron beam deflection apparatus. 3,674,977, Cl. 219-121.0eb.
Mc Allister, Lindsay G., to Commonwealth of Australia, care of Secretary Department of Supply, The. Acoustic sounder. 3,675,191, Cl. 340-1.00r.
Mc Namara, Matthew F.: *See*—
Dacey, Paul F.; De Toma, Samuel; Hayes, Thomas; and Mc Namara, Matthew F., 3,673,712.
McCarthy, Robert P.; and Matlock, Charles W., to Butler Manufacturing Company. Reinforced plastic panel and method of making the same. 3,674,620, Cl. 161-133.000.
McCloskey, Fenimore G.; and Jordan, William Robert, to Columbus Electric Manufacturing Co. Switching devices. 3,675,166, Cl. 335-164.000.
McConnell, Bobby D.: *See*—

Clow, William L.; Benzing, Robert J.; and McConnell, Bobby D., 3,674,690.

McCormick, James Benjamin, to Miles Laboratories, Inc. Biological specimen processing and embedding apparatus. 3,674,396, Cl. 425-117.000.

McCrae, William: *See—*
Edwards, John A.; Fried, John H.; and McCrae, William, 3,674,816.

McGee, Donald J., to H & H Equipment Company. Pneumatic suspension axle return device. 3,674,249, Cl. 267-52.000.

McGowan, Kenneth J. J., to Avco Corporation. Trip-line system. 3,673,963, Cl. 102-38.000.

McGrath, William L., to Carrier Corporation. Air conditioning system. 3,674,203, Cl. 236-38.000.

McGraw-Edison Company: *See—*
Weinfurt, William J., 3,675,237.

McGregor, Arvin D.: *See—*
McKissick, John A.; and McGregor, Arvin D., 3,675,201.

McGregor, John Cameron, to Atomic Energy of Canada Limited. Nuclear reactor fuel element assembly. 3,674,638, Cl. 176-81.000.

McKelvey, Harold E.: *See—*
Jendrisak, Joseph E.; and McKelvey, Harold E., 3,673,900.

McKenzie, James G. Chromatic harmonica. 3,674,910, Cl. 84-377.000.

McKiernan, Dennis Lester, to Bell Telephone Laboratories, Incorporated. Gated-clock time measurement apparatus including granularity error elimination. 3,675,127, Cl. 324-186.000.

McKissick, John A.; and McGregor, Arvin D., to Burroughs Corporation. Threshold voltage determination system. 3,675,201, Cl. 340-146.3ag.

McLauchlan, Thomas A.: *See—*
Fairfield, Louis R., Jr.; Van Vliet, Raymond A.; and McLauchlan, Thomas A., 3,674,065.

McMinimy, Lawrence O., to Potlatch Forests, Inc. Method of laminating untreated wood to wood treated with fire-retardant material. 3,674,596, Cl. 156-321.000.

McMurray, Mitchell; Plouzek, Eugene A.; and Sturges, James R., to Caterpillar Tractor Company. Constant pressure seal. 3,674,279, Cl. 277-95.000.

McNally, John S.: *See—*
Fekete, Frank; and McNally, John S., 3,674,727.

McNally, Sellers B., to Maremont Corporation. Coupling. 3,674,290, Cl. 285-248.000.

McNamara, Thomas J.; and Sangster, Arlon G. Circuit for multi-speed two-phase motor. 3,675,100, Cl. 318-220.00r.

McPherson, Frank Henderson: *See—*
Francini, Joseph Pirra; Braxton, James Lopez, Jr.; Lewis, Vera Gloria; McPherson, Frank Henderson; Rosenberg, Daniel; and Sekse, Torkjell, 3,674,988.

McQueen, Terry K.: *See—*
Jellison, Frank R.; Mason, John B.; and McQueen, Terry K., 3,674,283.

McRae, James L. Apparatus for cutting and marking plate stock of the type used in building wall panels. 3,674,064, Cl. 143-46.00r.

McShan, C. Hunter. Motor incorporating torsional mode resonator. 3,675,055, Cl. 310-22.000.

Mead Corporation, The: *See—*
Forrer, Homer W., 3,674,136.

Mead, Dennis E., to Lipe Corporation. Feeder for cylindrical objects. 3,674,128, Cl. 198-33.0aa.

Measurex Corporation: *See—*
Hill, Robert C.; French, John M.; and Toepfer, Richard E., 3,675,019.

Mee, John D.: *See—*
Eldredge, Carl H.; and Mee, John D., 3,674,782.

Meimoun, Daniel: *See—*
Parisot, Andre; and Meimoun, Daniel, 3,674,539.

Mekatron Corporation: *See—*
Vardaman, Hunter W., 3,673,896.

Melott, Norman W., to Cook-Waite Laboratories, Inc. Sealing closure caps. 3,673,766, Cl. 53-335.000.

Melvin, William J., to Collins Radio Company. Differentially coherent phase shift keyed digital demodulating apparatus. 3,675,129, Cl. 325-320.000.

Menger, Karl S.: *See—*
Lincoln, Andrew J.; and Menger, Karl S., 3,675,000.

Menzi, Hans: *See—*
Bommer, Peter; and Menzi, Hans, 3,674,102.

Mercer, Ronald H.: *See—*
Rutledge, Nolan W.; Mercer, Ronald H.; and Hill, Herbert Charles, Jr., 3,673,982.

Mercier, Jacques H. Pressure vessel. 3,674,054, Cl. 138-30.000.

Merck & Co., Inc.: *See—*
Ruyle, William V.; Sarett, Lewis H.; and Matzuk, Alexander R., 3,674,870.
Shen, Tsung-Ying; Witzel, Bruce E.; and Walford, Gordon L., 3,674,843.
Shen, Tsung-Ying; Jones, Howard; Witzel, Bruce E.; and Walford, Gordon L., 3,674,844.
Shen, Tsung-Ying; Ruyle, William V.; Witzel, Bruce E.; and Walford, Gordon L., 3,674,875.

Merck, James K., to Maremont Corporation. Spindle control means for automatic yarn piecing apparatus. 3,673,780, Cl. 57-34.00r.

Mereen, Donald E.; and Barrett, Jack E. J., to Midwest Communications & Audio, Incorporated. System for selection and remote control with sequential decoding having plural decoding stages. 3,675,205, Cl. 340-147.000.

Mergy, James I., to Curwood, Inc. Thermo-formable plastic material for making semi-rigid plastic packages. 3,674,626, Cl. 161-165.000.

Merlin Gerin, Societe Anonyme: *See—*
Labbaye, Louis; and Bernard, Georges, 3,675,079.
Leymarie, Claude P. H., 3,674,949.

Merriam, Marshall F., to Gulf Oil Corporation. Apparatus for power transmission. 3,675,042, Cl. 307-147.

Merrill, Edward W.; and Wong, Patrick Seck-lai, to Massachusetts Institute of Technology. Non-thrombogenic materials and methods for their preparation. 3,673,612, Cl. 3-1.000.

Meseck, Eugene: *See—*
Wright, Edward L.; and Meseck, Eugene, 3,673,851.

Messer Griesheim G.m.b.H.: *See—*
Becker, Werner; Farwer, Alfward; Frank, Georg; Reis, Bernhard; Rohf, Josef; and Auer, Rupert, 3,674,978.

Metallgesellschaft Aktiengesellschaft: *See—*
Laue, Hans-Jurgen Rainer; Bohm, Horst Otto; and Reddemann, Bernhard Hermann, 3,674,470.

Metallgesellschaft Aktiengesellschaft and Bergwerks-Verban: *See—*
Schmalfeld, Paul; Janssen, Heinrich; Bock, Burkhard; Peters, Werner; and Ahland, Erwin, 3,674,449.

Mettler Instruments AG: *See—*
Bommer, Peter; and Menzi, Hans, 3,674,102.

Metz, Louis C., to Sperry Rand Corporation. Digital-to-synchro/resolver converter. 3,675,234, Cl. 340-347.0da.

Meyer, Gilbert R.; and Everett, Rollo J., to CPC International Inc. Low density starch hydrolysates. 3,674,555, Cl. 127-29.000.

Meyer, Harold E.: *See—*
White, Kenneth N.; and Meyer, Harold E., 3,674,328.

Miceli, James V. Vehicular locking device. 3,674,046, Cl. 137-384.200.

Michaelsen, Alfred L., to Westvaco Corporation. Method and apparatus for orthogonal variables. 3,673,865, Cl. 73-159.000.

Michatek, Chester W.; and Harvey, Donad M., to Eastman Kodak Company. Multiple function frame member for cameras. 3,673,938, Cl. 95-13.000.

Michel, Raymond S.; and Podhora, Fred W., to United Medical Laboratories Inc. Means for and method of transfering blood from a patient to multiple text tubes within a vacuum. 3,674,011, Cl. 128-2.00f.

Michels, John: *See—*
Ellis, David R.; Michels, John; and Gabbert, Ira, 3,675,214.

Michie, James C., III: *See—*
Deal, Joseph D., Jr.; and Michie, James C., III, 3,674,042.

Michiels, Marie-Jose-Suzanne and: *See—*
Phlipot, Georges A.; Michiels, Marie-Jose-Suzanne and; and de Villeneuve, Yolande-Paule Marie-Josephe, 3,674,745.

Microsystems International Limited: *See—*
Hantusch, Gerald H.; Vincent, David A.; and Van Tongerloo, Eric H., 3,675,089.

Midland-Ross Corporation: *See—*
Kish, George R.; and Swanson, Kenneth B., 3,674,954.

Midwest Communications & Audio, Incorporated: *See—*
Mereen, Donald E.; and Barrett, Jack E. J., 3,675,205.

Miehle, James A.; Pratt, David S.; and Rees, Robert M., to Varian Associates, mesne. Status system. 3,675,204, Cl. 340-147.00r.

Mienstaedt, Robert, to Deering Milliken, Inc. Control circuit arrangement for controlling parameters of a process and a comparison circuit arrangement for use in conjunction with the control circuit arrangements. 3,674,993, Cl. 235-150.100.

Mifune, Hideo; and Tani, Kenroku, to Matsushita Electric Industrial Co., Ltd. Ultrasonic wave microphone. 3,675,053, Cl. 310-8.200.

Mihalick, Eugene Michael: *See—*
Strater, Kurt; Hall, William Bernard; Mihalick, Eugene Michael; and Stever, William Charles, 3,673,983.

Miles Laboratories, Inc.: *See—*
McCormick, James Benjamin, 3,674,396.

Miles, Wilson D.: *See—*
Trost, Joseph C.; Bock, Robert V.; Gerbstadt, Frederick H.; Graham, William J.; Miles, Wilson D.; and Questa, Charles R., 3,675,209.

Milgrom, Jack, to Little, Arthur D., Inc. Photoresist material and method of forming printing plates and resulting product. 3,674,486, Cl. 96-35.100.

Miller, Anthony D.: *See—*
de Gelder, Jacob; Baginski, Albert R.; and Miller, Anthony D., 3,674,271.

Miller, Charlie D., to Carrier Corporation. Tube testing apparatus. 3,673,858, Cl. 73-40.50r.

Miller, Eugene J., Jr.: *See—*
Tiefenthal, Harlan E.; Jungermann, Eric; Miller, Eugene J., Jr.; and Callahan, John J., 3,674,879.

Miller, John H. Valve boxes. 3,674,169, Cl. 220-4.00r.

Miller, Merlin S.; and Russo, Ronald D., to Koehler-Dayton, Inc. Head conversion unit. 3,674,148, Cl. 210-152.000.

Miller, Richard G., to PPG Industries, Inc. Solution for depositing transparent metal films. 3,674,517, Cl. 106-1.000.

Miller, Richard H. Chair construction. 3,674,311, Cl. 297-440.000.

Miller, Robert E., to Monsanto Company. Protein cross-linked with phosphonitrillic halide. 3,674,509, Cl. 99-22.00n.

Millipore Corporation: *See—*
Danti, Bernard, 3,674,147.
Post, Arthur H., Jr.; Polinsky, Ronald J.; and Dwyer, James L., 3,674,678.

Millman, William V.; and Mayer, Endre A., to Bendix Corporation, The. Vortex valve fluid oscillator. 3,674,045, Cl. 137-81.500.

Minganti, Ernesto. Device for anchoring new-born babies umbilical cords until atrophy thereof. 3,674,032, Cl. 128-346.000.

Miniailoff, Edward P. Fascia sections with interfitting parts for building walls. 3,673,748, Cl. 52-60.000.

Minks, Floyd M. High voltage ignition system transformer. 3,675,077, Cl. 315-209.00r.

Minnesota Mining and Manufacturing Company: *See—*
Gorbran, Ramsis; and Ofstead, Ronald F., 3,674,497.
Mitsch, Ronald A., 3,674,785.
Sagawa, Burt K., 3,673,962.

Minolta Camera Kabushiki Kaisha: *See—*
Kono, Tteomi, 3,673,905.

Mioduski, George T., to General Electric Company. Hand proximity alarm control circuit. 3,675,051, Cl. 307-308.000.

Mirick, William M., to Battelle Development Corporation, The. Correction fluid composition. 3,674,729, Cl. 260-23.0ar.

Mirrlees Blackstone Limited: *See—*
van-der-Ben, Charles Robert; and Pope, Joseph Albert, 3,674,576.

Misawa, Masanaru: *See—*
Tanaka, Katsunobu; Nara, Takashi; Misawa, Masanaru; and Komuro, Toshio, 3,674,641.

Mitchell, David F.; and Romanauskas, William A., to Sorvall, Ivan, Inc. Washing means for flexible bags in split enclosures. 3,674,197, Cl. 233-14.00r.

Mitchell, David S.; Bridge, Alan G.; and Scott, John W., to Chevron Research Company. Heavy oil conversion using fine particles. 3,674,682, Cl. 208-157.000.

Mitsch, Ronald A., to Minnesota Mining and Manufacturing Company. Certain fluorimino or azomethine containing compounds. 3,674,785, Cl. 260-243.00r.

Mitsubishi Chemical Industries Limited: *See—*
Iwasaki, Koichiro; Yamaguchi, Kazuo; Kimura, Harutaka; Hasuo, Masayoshi; and Tanaka, Toru, 3,674,764.
Yamawaki, Takeshi; Usami, Masakatsu; Suzuki, Tetsumi; and Uematsu, Takao, 3,674,759.

Mitsubishi Denki Kabushiki Kaisha: *See—*
Mitsui, Tsuneo; Baba, Jun-Ichi; and Yamada, Ikuo, 3,675,002.

Mitsubishi Electric Corporation: *See—*
Shunichiro, Nishizaki; and Akira, Fukami, 3,674,741.

Mitsubishi Kasei Kogyo Kabushiki Kaisha; a/k/a: *See—*
Yamawaki, Takeshi; Usami, Masakatsu; Suzuki, Tetsumi; and Uematsu, Takao, 3,674,759.

Mitsubishi Rayon Company Limited: *See—*
Miyamoto, Haruo; Uchida, Hideho; and Uehara, Masaru, 3,674,621.

Mitsui, Tsuneo; Baba, Jun-Ichi; and Yamada, Ikuo, to Tokyo Denryoku Kabushiki Kaisha and Mitsubishi Denki Kabushiki Kaisha. System for computing electric power flow. 3,675,002, Cl. 235-185.000.

Miyai, Yukio: *See—*
Teramoto, Iwao; Iwasa, Hitoo; Miyai, Yukio; and Takeshima, Masumi, 3,675,161.

Miyamoto, Haruo; Uchida, Hideho; and Uehara, Masaru, to Mitsubishi Rayon Company Limited. Process of making a sheet paper. 3,674,621, Cl. 162-146.000.

Miyanohara, Isao: *See—*
Otsuki, Susumu; Hori, Kyoichi; and Miyanohara, Isao, 3,674,651.

Miyata, Yasuo: *See—*
Nakamura, Naoya; and Miyata, Yasuo, 3,674,763.

Miyazuka, Hajime: *See—*
Tamai, Yasuo; and Miyazuka, Hajime, 3,674,476.

Mizugaki, Yoshikazu: *See—*
Ikuo, Yorio; Okabayashi, Minoru; Ono, Keisuke; Mizugaki, Yoshikazu; and Hayashi, Juntaro, 3,674,129.

Mizuno, Tadasi, to Kabushiki-Kaisha Tokai Rika Denki Seisakusho. Theft preventing devices in motor vehicles. 3,673,829, Cl. 70-252.000.

Mizzi, Joseph Michael. Cane harvester. 3,673,774, Cl. 56-13.900.

Mizzoni, Renat Herbert; and Blatter, Herbert Morton, to Ciba-Geigy Corporation. Certain-3-pyridine-sulfonamide derivatives. 3,674,794, Cl. 260-294.80f.

Moberly, Raymond Ronald: *See—*
Owen, James Neal; Moberly, Raymond Ronald; Martin, Edwin J., Jr.; Yamada, Akemichi; and Thomas, Edmund C., 3,675,162.

Modern Research Inc., mesne: *See—*
Davies, Ronald C., 3,675,036.

Moe, John L.: *See—*
Harkenrider, Robert J.; and Moe, John L., 3,675,046.

Moeller & Neumann GmbH: *See—*
Bier, Albert, 3,673,841.

Moesser, Wilhelm, to Strecker, Otto C., K.G.; and and Maschinenfabrik zum Bruderhaus G.m.b.H. Drawing press. 3,674,194, Cl. 226-187.000.

Mohri, Yohichi, to Nissan Motor Company, Limited. Fluid operated position selecting device. 3,673,926, Cl. 92-51.000.

Moll, Franz; Posse, Rolf-Fred; and Ringe, Werner, to Agfa-Gevaert Aktiengesellschaft. Preparation of silver dispersions for use in filter and antihalation layers. 3,674,703, Cl. 252-313.00r.

Moll, Hans Heinrich; and Ockl, Otto. Axle housing. 3,673,888, Cl. 74-607.000.

Mollenbeck, Klaus: *See—*
Hermstein, Wolfgang; and Mollenbeck, Klaus, 3,675,123.

Mollgaard, Anton N.: *See—*
Allison, Arthur F.; Greening, Donald J.; and Mollgaard, Anton N., 3,675,104.

Molloy, Kenneth H.; Ward, John P.; and Benson, Victor Mark, to Computer Systems Engineering, Inc. Traffic signal control system. 3,675,196, Cl. 340-40.000.

Monsanto Company: *See—*
Alt, Gerhard H., 3,674,459.
Arrant, Kearney D., 3,674,165.
Darlington, Walter A.; and Chupp, John P., 3,674,849.
Franz, John E., 3,674,802.
Howe, Robert K., 3,674,460.
Miller, Robert E., 3,674,509.
Mottus, Edward H.; and Ort, Morris R., 3,674,766.
Ridgway, James S.; King, Henry L.; and Pickett, Oscar A., Jr., 3,674,752.
Somich, Robert T., 3,674,708.
Timbie, Robert W., 3,673,783.

Monsanto Europe S.A., mesne: *See—*
Andros, Arthur A., 3,674,512.

Monsanto Research Corporation: *See—*
Stemniski, John R., 3,674,822.

Montagano, Anthony. Head rest attachment for wheel chairs. 3,674,310, Cl. 297-397.000.

Montague, Bernard R.: *See—*
Leyburn, Derek; Montague, Bernard R.; and Mattila, Henry K., 3,674,940.

Montague Burton Limited: *See—*
Jacobson, Sydney; Knowles, Denis; and Parker, Derek, 3,674,592.

Monti, Giancarlo, to Siai-Marchetti S.p.A. Helicopter rotor blade. 3,674,379, Cl. 416-226.000.

Montt, Michael R., to Massachusetts Institute of Technology. Video pointer. 3,674,930, Cl. 178-7.50r.

Moodie, Donald E., to Polaroid Corporation. Switch programming device with sequentially actuated switches. 3,674,965, Cl. 200-153.00r.

Moon, Edward Leslie: *See—*
Berkelhammer, Gerald; Asato, Goro; and Moon, Edward Leslie, 3,674,780.

Moore Business Forms, Inc.: *See—*
Dodgson, Hugh, 3,674,286.

Moore Company, The: *See—*
Moore, Junius T., Jr., 3,673,719.

Moore, Junius T., Jr., to Moore Company, The. Indicia plate with means for aligning same with a frame member. 3,673,719, Cl. 40-20.00r.

Moore, Ted R., to Cities Service Oil Company. Method for stimulating hydrocarbon-bearing formations. 3,674,089, Cl. 166-245.000.

Moran, Arthur Stone: *See—*
Schweizer, Max Norman; and Moran, Arthur Stone, 3,674,324.

Morane, Bruno P., to L'Oreal. Valve for simultaneously dispensing a plurality of pressurized fluids. 3,674,180, Cl. 222-145.000.

Morat, Franz, G.m.b.H., Firma: *See—*
Gottschall, Gernot, 3,674,192.

Morcaldi D', Rosario Forlano. Loop fabric structure. 3,673,915, Cl. 87-12.000.

Moreau, Glenn T.; and Bielefeldt, Irvin P., to Alco Standard Corporation. Fluxless brazing process. 3,673,678, Cl. 29-494.000.

Morgenstern, Dieter: *See—*
Dijkhuizen, Willem; Termin, Erich; Bleh, Otto; and Morgenstern, Dieter, 3,674,716.

Morinaga Milk Industry Co., Ltd.: *See—*
Nagasawa, Taro; Tomita, Mamoru; Obayashi, Tomokazu; Tamura, Yoshitaka; and Kenmotsu, Yoko, 3,674,500.

Moritani, Ichiro; and Fujiwara, Yuzo, to Ube Industries, Ltd. Process for the preparation of aromatic hydrocarbons containing monoethylenic unsaturated radicals. 3,674,884, Cl. 260-669.00r.

Moroney, John J.; and Tharp, Edwin B., to Torrington Company, The. Bearing. 3,674,325, Cl. 308-35.000.

Moronval, Gerard: *See—*
Richard, Gilbert; and Moronval, Gerard, 3,675,033.

Morris, Philip, Incorporated: *See—*
Iten, Clemens A., 3,673,672.
Rainer, Norman B., 3,674,683.
Rainer, Norman B.; and Wilson, Peter A., 3,674,722.

Morse, Theodore H., to Eastman Kodak Company. Control for bias of magnetic brush and method. 3,674,532, Cl. 117-17.500.

Moser, James R.: *See—*
Maier, Robert E., Jr.; and Moser, James R., 3,674,258.
Schneider, Alan A.; and Moser, James R., 3,674,562.

Mosher, Paul R.: *See—*
MacKenzie, Gerald L.; and Mosher, Paul R., 3,674,702.

Motoren- und Turbinen-Union Munchen GmbH: *See—*
Trappmann, Klaus, 3,674,377.

Motorola, Inc.: *See—*
Coleman, Michael G.; and Huffman, Tommie R., 3,675,064.

Mototani, Hideo: *See—*
Suzuki, Reiichi; Tahara, Tadasu; and Mototani, Hideo, 3,674,769.

Mottier, Francois: *See—*
Iten, Paul Dominik; and Mottier, Francois, 3,675,029.

Mottus, Edward H.; and Ort, Morris R., to Monsanto Company. Polymerization of ethylene and catalysts therefor. 3,674,766, Cl. 260-88.200.

Moulinage & Retorderie de Chavanoz, mesne: *See*—
Raschle, Josef, 3,673,782.
Mount Hope Machinery Company: *See*—
Koster, Klaus, 3,673,647.
Mourning, James R.: *See*—
Cashin, William F.; and Mourning, James R., 3,673,867.
Mowogrozki, Markus: *See*—
Russo, Paul; and Mowogrozki, Markus, 3,675,093.
Mozley, Richard Henry: *See*—
Muller, Leslie Dyne; Sayles, Charles Philip; and Mozley, Richard Henry, 3,674,144.
MSL Industries, Inc.: *See*—
Willis, Arnold L., 3,673,757.
Mte-Contactor Components Limited: *See*—
Olley, Norman Harry, 3,675,168.
Mullaly, Jerome R., to General Electric Company. Voltage responsive switch. 3,675,045, Cl. 307-235.000.
Muller, Erwin: *See*—
Wirth, Wolf-Dieter; and Muller, Erwin, 3,674,837.
Muller, Hans: *See*—
Hoegger, Anton, 3,674,146.
Muller, Leslie Dyne; Sayles, Charles Philip; and Mozley, Richard Henry. Gravity separation of granular materials. 3,674,144, Cl. 209-468.000.
Mulligan, William L., to Parks-Cramer Company. Remote crane motor control with variable direction and speed of movement. 3,675,097, Cl. 318-17.000.
Munroe, Miles R.: *See*—
Snaper, Alvin A.; Gregory, George D.; and Munroe, Miles R., 3,675,220.
Muntz, Frank F. Shaver with improved hair setup. 3,673,684, Cl. 30-34.200.
Murase, Yoshihiko, to Nippon Gakki Seizo Kabushiki Kaisha. Thermoplastic laminated structure. 3,674,109, Cl. 181-32.00r.
Murashige, Hidekichi; Simakura, Masao; and Nakazawa, Kazuo, to Kawatetsu Kizai Kogyo Co., Ltd. Lift up process. 3,673,754, Cl. 52-747.000.
Muratorio, Jorge R., to Celanese Corporation. Production of alpha-naphthyl methanesulfonate esters. 3,674,830, Cl. 260-456.00p.
Murman, Fernando: *See*—
Lewis, George E.; and Murman, Fernando, 3,674,123.
Murman, Fernando; and Lewis, George E., to Hydril Company. Replaceable bladder pulsation dampener. 3,674,053, Cl. 138-30.000.
Murphy, Peter C.: *See*—
Haarbye, Fredrik O.; and Murphy, Peter C., 3,674,446.
Musgen, Bruno: *See*—
Degenkolbe, Joachim; and Musgen, Bruno, 3,674,577.
Mutch, Robert Douglas, to Dominion Bridge Company Limited. Ingot and mold handling tongs. 3,674,302, Cl. 294-118.000.
Myers, Herman A. Liquid fuel operated automatic weapons. 3,673,917, Cl. 89-7.000.
Myers, William N., Jr., to American Micro-Systems, Inc., mesne. Frequency selecting system. 3,674,917, Cl. 178-2.00r.
Myrenne, Karl-Dieter S.: *See*—
Hedman, Clarence L., Jr.; and Myrenne, Karl-Dieter S., 3,674,341.
N. L. Industries, Inc., mesne: *See*—
Bronson, George E., 3,674,528.
Nagahara, Shigehiro: *See*—
Suzuki, Yoshiro; Nagahara, Shigehiro; and Ichimura, Nobuyoshi, 3,674,520.
Naganuma, Mitsuaki: *See*—
Akiyama, Susumu; and Naganuma, Mitsuaki, 3,674,929.
Nagao, Taichiro: *See*—
Kurauchi, Noritaka; Tada, Shotaro; Shima, Hiroshi; Hiraoka, Susumu; Nagao, Taichiro; Koyama, Masahiro; Shiraishi, Satoshi; Shindo, Masuo; and Kobayashi, Yoshinobu, 3,674,990.
Nagasawa, Masahiro, to Matsushita Electric Industrial Co., Ltd. Negative resistance device. 3,675,088, Cl. 317-234.00r.
Nagasawa, Taro; Tomita, Mamoru; Obayashi, Tomokazu; Tamura, Yoshitaka; and Kenmotsu, Yoko, to Morinaga Milk Industry Co., Ltd. Process of producing a meat-like texturized food product. 3,674,500, Cl. 99-17.000.
Nagel, Erich: *See*—
Kohler, Roland; Nagel, Erich; Hujer, Friedrich; and Viehrig, Wolfgang, 3,674,365.
Nagy, Charles S., to National Cash Register Company, The. Punch card controlled accounting machine. 3,674,989, Cl. 235-61.60r.
Naito, Takeo; Hirata, Miyoshi; and Isoda, Sumiro, to Daiichi Seiyaku Co., Ltd. Salts of ethyl o-(cyclohexylaminoalkanoylamino)-benzoate. 3,674,833, Cl. 260-470.000.
Nakajima, Yasuo; Hayashi, Yoshimasa; and Sugihara, Kunihiko, to Nissan Motor Company, Limited. Air-pollution preventive system for motor vehicles. 3,673,993, Cl. 123-119.00a.
Nakamura, Naoya; and Miyata, Yasuo, to Daikin Kogyo Co., Ltd. Process for curing fluoroelastomer. 3,674,763, Cl. 260-87.700.
Nakamura, Yasusi: *See*—
Ueda, Tadao; Sato, Kenji; and Nakamura, Yasusi, 3,674,426.
Nakano, Tooru: *See*—
Takeda, Isao; Iguchi, Takashi; Tsuzuki, Katsuaki; and Nakano, Tooru, 3,674,639.
Nakazawa, Kazuo: *See*—
Murashige, Hidekichi; Simakura, Masao; and Nakazawa, Kazuo, 3,673,754.
Nalco Chemical Company: *See*—
Aitken, Thomas; Anderson, Donald R.; and Jursich, Myron J., 3,674,725.
Wolfson, Leonard L., 3,674,457.
Naomoto, Susumu; Kaneko, Tadataka; and Esaki, Hideya, to Matsushita Electronics Corporation and Matsushita Electric Industrial Co., Ltd. Planar P-N junction with mesh field electrode to avoid pinhole shorts. 3,675,091, Cl. 317-235.00r.
Nara, Takashi: *See*—
Tanaka, Katsunobu; Nara, Takashi; Misawa, Masanaru; and Komuro, Toshio, 3,674,641.
Nasu, Takuya: *See*—
Sugaya, Hiroshi; and Nasu, Takuya, 3,674,942.
National Cash Register Company, The: *See*—
Ackerman, Howard T.; and Kessler, Clarence W., 3,675,239.
Bayless, Robert G.; Shank, Charles P.; Botham Ruth A.; and Werkmeister, Dennis W., 3,674,704.
Blose, James H.; and Talvalkar, Shashikant G., 3,674,535.
Cartmell, James V.; and Churchill, Donald, 3,674,338.
Clinehens, Richard M.; Stewart, John K., Jr.; and Ditmer, Robert W., 3,674,579.
Fischer, Robert E.; Raiff, Lawrence C.; Seybold, James M.; and Zimmerle, Donald F., 3,674,924.
Nagy, Charles S., 3,674,989.
Patel, Pravin K.; and Stone, Eliot, 3,674,554.
Schaab, Carl K.; Weyrauch, George T.; and Davis, Terry R., 3,674,589.
National Distillers and Chemical Corporation: *See*—
Lerman, Frank; and Bartsch, Raymond C., 3,674,736.
National Patent Development Corporation: *See*—
Shepherd, Thomas H.; and Gould, Francis E., 3,674,901.
National Research Development Corporation: *See*—
Giltrow, Jeremy Peter; Kinner, George Henry; and Lancaster, John Keith, 3,674,689.
Lilly, Malcolm Douglas; Kay, Garth, and; Wilson, Richard John Hugh; and Sharp, Alister Kimball, 3,674,767.
Pitteway, Michael Lloyd Victor, 3,675,230.
National Research Institute for Metals, Director of: *See*—
Tachikawa, Kyoji; Tanaka, Yoshiaki; and Fukuda, Satoshi, 3,674,553.
Naumova, Sofia Fadeevna: *See*—
Bokov, Jury Sergeevich; Vikulina, Ninel Vladimirovna; Dogadkin, Boris Aristarkhovich; Erofeev, Boris Vasilievich; Larina, Anastasia Vasilievna; Lavrischev, Vadim Petrovich; Markov, Vladimir Vladimirovich; Naumova, Sofia Fadeevna; Jurina, Olge Demidovna; and Yarovaya, Galina Dmitrievne, 3,674,496.
Nayler, John Herbert Charles: *See*—
Long, Anthony Alfred Walter; and Nayler, John Herbert Charles, 3,674,776.
Neale, Ronald G., to Energy Conversion Devices, Inc. Film deposited semiconductor devices. 3,675,090, Cl. 317-234.00r.
Neathway, Graham Albert: *See*—
Livermore, Frederick C.; and Neathway, Graham Albert, 3,674,659.
Nebold, Jerome I.: *See*—
Fritts, Russell A.; and Nebold, Jerome I., 3,673,921.
Nederlandse Maatschappij voor werken Buitengaats Netherlands Offshore Company N.V.: *See*—
Volbeda, Johan H., 3,673,808.
Neeb, Robert P.; and Patrick, Henry W., to Diazit Company Inc. Sheet separator for copying machines. 3,674,257, Cl. 271-64.000.
Nelson Carl T.: *See*—
Arganbright, Ned H.; Koepnick, Paul J.; Nelson Carl T.; and O'-Brien, Arthur F., 3,673,949.
Nelson, Kenneth R., to Schlage Lock Company. Lock cylinder body and method of providing the same. 3,673,831, Cl. 70-373.
Nelson, Melvin A.; Lackey, Jerry G.; and Davies, Terence J., to United States of America, Atomic Energy Commission, mesne. Kerr cell system for modulating a laser beam. 3,675,022, Cl. 250-199.000.
Nelson, Roger John, to Deere & Company. Servo-control for an agricultural tractor hydraulic lift. 3,674,095, Cl. 172-7.000.
Nercessian, Sarkis, to Forbro Design Corporation. High current voltage/current regulator employing a plurality of parallel connected power transistors. 3,675,114, Cl. 323-9.000.
Nerwin, Henry N.: *See*—
Flaherty, John J.; and Nerwin, Henry N., 3,673,860.
Neubeck, William H., Jr., to Bloomer-Fiske, Inc. Loading table for use with continuous production of wieners. 3,674,163, Cl. 214-309.000.
Neudek, Rudolph Otto: *See*—
Rachlin, Joel R.; and Neudek, Rudolph Otto, 3,673,945.
Neue Argus Gesellschaft m.b.H.: *See*—
Kaiser, Rudolf, 3,674,326.
Neugebauer, Walter: *See*—
Illigen, Alfred; and Neugebauer, Walter, 3,674,430.
Neuhaus, Herbert M., to United States of America, Navy. Extrusion press and barrel. 3,674,407, Cl. 425-378.000.
Neuhauser, Hans; Benz, Helmut; and Gukelberger, Werner, to Gustav Neuhauser Prazisionswerkzeugfabik O.M.G. Apparatus for helically machining a blank of varying diameter. 3,673,919, Cl. 90-11.620.
Neumeyer, John L.: *See*—
Papanastassion, Zion B.; and Neumeyer, John L., 3,674,809.
Newmont Exploration Limited: *See*—
Yannopoulos, John C., 3,674,463.
Newport News Shipbuilding and Dry Dock Company: *See*—
Deal, Joseph D., Jr.; and Michie, James C., III, 3,674,042.

NGK Insulators, Ltd.: *See—*
Higuchi, Noboru; Ogawa, Yutaka; and Watanabe, Akihiro, 3,674,519.
N.G.N. Limited: *See—*
Cooper, Michael Henry; and Fryatt, Leslie Alva, 3,673,904.
Nicholl, Thomas H. Induction charging device. 3,675,108, Cl. 320-2.000.
Niegisch, Walter D., to Union Carbide Corporation. Surface crystallized poly (2,2,4,4-tetramethyl-cyclobutanediol-1,3) carbonates. 3,674,623, Cl. 161-164.
Nielsen, Edwin A.: *See—*
Cooper, Julius; and Nielsen, Edwin A., 3,674,269.
Nielsen, Ole; and Beidil, Max. Method of manufacturing a foil material embossed on both sides, a roll nip and a machine for carrying out the method. 3,673,839, Cl. 72-196.000.
Nielson, Lonnie R., to Carlon Engineering Company, Incorporated. Expansible wrist band. 3,673,795, Cl. 59-80.000.
Nielson, Stephen M., to Texas Gulf Sulphur Company. Control of organic deposition in slurry heaters in potash crystallizer circuit. 3,674,442, Cl. 23-299.000.
Niese, William F., to Libbey-Owens-Ford Company. Locating device. 3,673,664, Cl. 29-203.00p.
Nikolov, Petko Petrov: *See—*
Tsvetkov, Krum Kostov; Ezekiev, Ezekiya Gueorguiev; Nikolov, Petko Petrov; and Otsetov, Vassil Christov, 3,674,991.
Nilson, Hans Erik: *See—*
Elsner, Nils Ake; and Nilson, Hans Erik, 3,674,513.
Ninomiya, Shoichi; Sakai, Masaaki; Oka, Sakae; and Kusunoki, Kikunobu, 50% to Fujitsu Limited and 50% to Nippon Telegraph and Telephone Public Corporation. Coincident-current magnetic core memory with combined inhibit and sense winding. 3,675,224, Cl. 340-174.0cr.
Nippon Electric Company, Limited: *See—*
Akiyama, Susumu; and Naganuma, Mitsuaki, 3,674,929.
Ueda, Isao; Kageyama, Takao; and Inomata, Isao, 3,675,165.
Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Ludemann, Ingo, 3,674,908.
Murase, Yoshihiko, 3,674,109.
Suzuki, Nobuhiko, 3,675,173.
Nippon Kogaku K.K.: *See—*
Tsukamoto, Masaaki; Fujii, Tatsuo; and Ono, Shigeo, 3,675,179.
Nippon Telegraph and Telephone Public Corporation: *See—*
Ninomiya, Shoichi; Sakai, Masaaki; Oka, Sakae; and Kusunoki, Kikunobu, 3,675,224.
Nippondenso Kabushiki Kaisha: *See—*
Kato, Takaaki; Kawakubo, Mamoru; and Ito, Katsunori, 3,673,892.
Nissan Motor Company, Limited: *See—*
Aono, Shigeo; Manaka, Nobuzi; and Inagaki, Tokuichi, 3,673,989.
Aono, Shigeo, 3,673,994.
Fukasawa, Noburu; and Hatori, Yukiyoshi, 3,675,227.
Haruna, Takashi; and Taniguchi, Kazutaka, 3,674,951.
Ishii, Hirozi; and Okamoto, Koichi, 3,673,659.
Mohri, Yohichi, 3,673,926.
Nakajima, Yasuo; Hayashi, Yoshimasa; and Sugihara, Kunihiko, 3,673,993.
Sawada, Hiraki, 3,673,997.
Yamadai, Tadaaki; Kushida, Tadao; Konishi, Hiroshi; and Inaba, Yoshinari, 3,673,631.
Nistri, Ugo: *See—*
Pitzalis, Mario; Vargiu, Silvio; and Nistri, Ugo, 3,674,732.
Nitto Kasei Co., Ltd.: *See—*
Suzuki, Reiichi; Tahara, Tadasu; and Mototani, Hideo, 3,674,769.
Nitzsche, Siegfried; Kaiser, Wolfgang; Wohlfarth, Ernst; and Hittmair, Paul, to Wacker-Chemie G.m.b.H. Room temperature vulcanizable silicone rubber stocks. 3,674,738, Cl. 260-46.50g.
Noble, Frank Raymond, to English Clays Lovering Pichin & Company Limited. Clay. 3,674,521, Cl. 106-72.000.
Noltemeyer, Friedrich: *See—*
Reisacher, Josef; Noltemeyer, Friedrich; and Dziggel, Reiner, 3,674,000.
Noone, Thomas M., to Richardson Company, The. Composite material and process for preparing same. 3,674,547, Cl. 117-135.500.
Norcross, Paul A.: *See—*
Jamison, Robert W.; and Norcross, Paul A., 3,675,199.
Nordgren, Hans Elov. Device in foldable enclousres. 3,673,638, Cl. 24-19.000.
Nordstrom, John David, to Ashland Oil, Inc. Vinyl carbamyloxy carboxylates. 3,674,838, Cl. 260-482.00c.
Norling, Charles H.: *See—*
Edstrom, Woodrow O.; and Norling, Charles H., 3,673,669.
Nortec Computer Devices, Inc.: *See—*
Curtiss, Robert H.; Holzman, Richard; and Lazarow, Seldan A., 3,673,955.
North American Rockwell Corporation: *See—*
Estes, Joseph F.; and Kertesz, Imre, 3,673,873.
Jezuit, Leslie J.; and Kollars, Harold R., 3,673,959.
Northern Electric Company, Limited: *See—*
Chulak, William, 3,674,947.
Livermore, Frederick C.; and Neathway, Graham Albert, 3,674,659.
Northrop Corporation: *See—*
Vahlstrom, Richard E.; Nutten, Donald C.; and Bayne, Dennis R., 3,675,047.
Norton, Neil C. Method of preventing vapor lock during engine operation and of fuel leakage to carburetor after engine stoppage. 3,674,043, Cl. 137-12.000.
Nosal Vsevolod Vladimirovich: *See—*
Tselikov, Alexandr Ivanovich; Nosal Vsevolod Vladimirovich; and Verderevsky, Vadim Anatolievich, 3,673,840.
Novak, Opal B. Furnace register humidifier. 3,673,770, Cl. 55-234.000.
Novo Terapeutisk Laboratorium A/S: *See—*
Aunstrup, Knud; Andresen, Otto; and Outtrup, Helle, 3,674,643.
Nowak, Robert M.; and Ginter, Thomas O., to Dow Chemical Company, The. Thermosettable resins containing vinylester resin, polydiene rubbers and vinyl monomers. 3,674,893, Cl. 260-836.000.
NRM Corporation: *See—*
Gazuit, Georges, 3,674,604.
Nugent, Reginald F.; and Snyder, George P., to Time Research Laboratories, Inc. Apparatus for assembling stacks. 3,674,975, Cl. 219-85.000.
Nutten, Donald C.: *See—*
Vahlstrom, Richard E.; Nutten, Donald C.; and Bayne, Dennis R., 3,675,047.
Nutter Engineering Company; division: *See—*
Freeman, Darrell L., 3,674,246.
N.V. Chefaro Maatschappij: *See—*
van Driel, Hendrik, 3,674,855.
Nystrand, Ernst Daniel, to Paper Converting Machine Co., Inc. Apparatus for applying adhesive seams to webs. 3,674,608, Cl. 156-553.000.
Obayashi, Tomokazu: *See—*
Nagasawa, Taro; Tomita, Mamoru; Obayashi, Tomokazu; Tamura, Yoshitaka; and Kenmotsu, Yoko, 3,674,500.
Obenland, Clayton O.; Papetti, Stelvio; and Smith, Hampton D., Jr., to Olin Corporation. Sulfur-containing carborane derivatives and the method of preparation. 3,674,853, Cl. 260-606.5.
Oberst, Hermann; Ebigt, Joachim; Duve, Gunther; and Schommer, Alfred, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Vibration damped sandwich systems having interlayers of vinyl acetate/2-ethylhexyl acrylate/ dibutyl maleate/crotonic acid copolymers. 3,674,624, Cl. 161-165.000.
Oberst, Hermann; Ebigt, Joachim; Duve, Gunther; and Schommer, Alfred, to Farbwerke Hoechst Aktiengesellschaft vormals Lucius & Bruning. Vibration damped sandwich systems having interlayers of vinyl acetate/N-butyl acrylate/dibutyl maleate/ crotonic acid copolymers. 3,674,625, Cl. 161-165.000.
Obrador, Guillermo M. Apparatus for drying clothing. 3,673,702, Cl. 34-162.000.
O'Brien, Arthur F.: *See—*
Arganbright, Ned H.; Koepnick, Paul J.; Nelson Carl T.; and O'Brien, Arthur F., 3,673,949.
O'Brien, Kevin Christopher, to Bell Telephone Laboratories, Incorporated. Apparatus for use in measuring phase dispersion produced by apparatus or a system. 3,675,136, Cl. 328-133.000.
Ockl, Otto: *See—*
Moll, Hans Heinrich; and Ockl, Otto, 3,673,888.
O'Donnell, Thomas P. Brush handle comprising fencelike portions for fencing in its bristles, and the like. 3,673,630, Cl. 15-160.000.
Officine Alfieri Maserati: *See—*
Alfieri, Giulio, 3,673,990.
Offner, Abe, to Perkin-Elmer Corporation, The. Catoptric anastigmatic afocal optical system. 3,674,334, Cl. 350-55.000.
Ofstead, Ronald F.: *See—*
Gorbran, Ramsis; and Ofstead, Ronald F., 3,674,497.
Ogawa, Shinsaku: *See—*
Seko, Maomi; Ogawa, Shinsaku; Komori, Ryozo; Asuma, Masaro; Isoya, Toshiro; and Sakai, Takamasa, 3,674,653.
Ogawa, Yutaka: *See—*
Higuchi, Noboru; Ogawa, Yutaka; and Watanabe, Akihiro, 3,674,519.
Ogle, Robert W., to IMS Limited, mesne. Multi-mix. 3,674,028, Cl. 128-272.000.
Ohshita, Masahide; and Tsukagoshi, Tsunehiro, to Pioneer Electronic Corporation. Manufacturing process for an InSb thin film semiconductor element. 3,674,549, Cl. 117-201.000.
Oimoen, Anders. Portable grinder. 3,673,744, Cl. 51-177.000.
Oka, Sakae: *See—*
Ninomiya, Shoichi; Sakai, Masaaki; Oka, Sakae; and Kusunoki, Kikunobu, 3,675,224.
Okabayashi, Minoru: *See—*
Ikuo, Yorio; Okabayashi, Minoru; Ono, Keisuke; Mizugaki, Yoshikazu; and Hayashi, Juntaro, 3,674,129.
Okamoto Chemical Industry Company Limited: *See—*
Esaka, Teruo, 3,674,495.
Okamoto, Koichi: *See—*
Ishii, Hirozi; and Okamoto, Koichi, 3,673,659.
Oleszko, Thaddeus J.; and Walker, Lynn P., to Marathon Oil Company. Quenching process for pyrolytically cracked hydrocarbons. 3,674,890, Cl. 260-683.000.
Olin Corporation: *See—*
Early, Robert M.; and Raes, Maurice C., 3,674,718.
Fuzesi, Stephen; and Lapkin, Milton, 3,674,717.
Obenland, Clayton O.; Papetti, Stelvio; and Smith, Hampton D., Jr., 3,674,853.
Vercoglio, John W., 3,673,845.
Olin Mathieson Chemical Corporation: *See—*

Pryor, Michael J.; and Anthony, William H., 3,674,569.
Rao, Vellyur Nott Padmanabha; Scott, John A.; and Surowiecki, Benjamin M., Jr., 3,674,827.

Olinkraft, Inc.: *See—*
Graser, Earl J., 3,674,137.

Olivetti, Ing., C., & C., S.p.A.: *See—*
Giolitti, Nicolo, 3,674,201.
Giolitti, Nicolo; and Daly, Dante, 3,674,202.

Olley, Norman Harry, 1/2 to Mte-Contactor Components Limited. Electrical relays. 3,675,168, Cl. 335-198.000.

O'Loughlin, James P., to Raytheon Company. Power supply providing synchronized energization of a load. 3,675,115, Cl. 323-6.000.

Olson, Virginia A.: *See—*
Bates, John D.; and Olson, Virginia A., 3,674,029.

Omark Industries, Inc.: *See—*
Tupper, Myron D.; and Hille, Arvin A., 3,674,220.

Omron Tateisi Electronics Co.: *See—*
Iwamoto, Shunsuke; and Kawasaki, Ryohei, 3,675,195.
Osaki, Keisuke; Egashira, Hiroshi; and Hayashi, Yasunori, 3,675,206.

Ono, Keisuke: *See—*
Ikuo, Yorio; Okabayashi, Minoru; Ono, Keisuke; Mizugaki, Yoshikazu; and Hayashi, Juntaro, 3,674,129.

Ono, Shigeo: *See—*
Tsukamoto, Masaaki; Fujii, Tatsuo; and Ono, Shigeo, 3,675,179.

Ono, Takeshi, to Aisin Seiki Kabushiki Kaisha. Zigzag sewing machine. 3,673,971, Cl. 112-158.000.

O'Rear, Cecil N. Double box dump trailer. 3,674,312, Cl. 298-8.00t.

Orenstein, Nathan: *See—*
Hansen, Neil W.; and Orenstein, Nathan, 3,675,132.

Ort, Morris R.: *See—*
Mottus, Edward H.; and Ort, Morris R., 3,674,766.

Orth, Hans. Injection molding machine for processing thermo plastic synthetic material having explosive charging and clamping units. 3,674,386, Cl. 425-1.000.

Osakeyhtio, A. Ahlstrom: *See—*
Evalahti, Osmo Rainer, 3,674,633.

Osaki, Keisuke; Egashira, Hiroshi; and Hayashi, Yasunori, to Omron Tateisi Electronics Co. Automatic ticket gate. 3,675,206, Cl. 340-149.00a.

Osaki, Yoshiyasu: *See—*
Tani, Isamu; Otsuka, Masatomi; Osaki, Yoshiyasu; and Hagino, Takuo, 3,674,646.

Osborne, David Richard Duke, to Lever Brothers Company. Substituted salicylanilides. 3,674,850, Cl. 260-559.00s.

Oshima, Susumu: *See—*
Kakumu, Ichizo; and Oshima, Susumu, 3,674,003.

Oshima, Teruo: *See—*
Yamamoto, Keisaku; Takao, Hiroyoshi; Hirooka, Masaaki; and Oshima, Teruo, 3,674,755.

Osplack, Joseph J.; and Osplack, Rodman J. Method of producing internal gearing. 3,673,660, Cl. 29-159.200.

Osplack, Rodman J.: *See—*
Osplack, Joseph J.; and Osplack, Rodman J., 3,673,660.

Ostby & Barton Co.: *See—*
Smith, James P., 3,675,189.

Ota, Keiichi. High-strength silicon steel. 3,674,468, Cl. 75-128.00a.

Otani, Akemasa. Iron scrap bundles. 3,674,444, Cl. 29-186.000.

Othu, Ikuo: *See—*
Koide, Tsuyoshi; and Othu, Ikuo, 3,673,741.

Otsetov, Vassil Christov: *See—*
Tsvetkov, Krum Kostov; Ezekiev, Ezekiya Gueorguiev; Nikolov, Petko Petrov; and Otsetov, Vassil Christov, 3,674,991.

Otsuka Kagaku Yakuhin Kabushiki Kaisha: *See—*
Tani, Isamu; Otsuka, Masatomi; Osaki, Yoshiyasu; and Hagino, Takuo, 3,674,646.

Otsuka, Masatomi: *See—*
Tani, Isamu; Otsuka, Masatomi; Osaki, Yoshiyasu; and Hagino, Takuo, 3,674,646.

Otsuki, Susumu; Hori, Kyoichi; and Miyanohara, Isao. Polymerization inhibition of acrylic acid. 3,674,651, Cl. 203-8.000.

Otto, Hans-Werner: *See—*
Hoffmann, Horst; Krauch, Carl Heinrich; Otto, Hans-Werner; and Volkert, Otto, 3,674,494.

Otto, Julian A.: *See—*
Sweeney, Richard F.; Khan, Aziz Urrehman; Price, Alson K.; Jones, Edward Stephen; and Otto, Julian A., 3,674,800.

Otto, Wolfgang Karl Ferdinand, to Deering Milliken Research Corporation. Process of annealing resin modified textile fabrics. 3,674,417, Cl. 8-115.500.

Outtrup, Helle: *See—*
Aunstrup, Knud; Andresen, Otto; and Outtrup, Helle, 3,674,643.

Ovelson, Kenneth Vernon. Test hole plug. 3,674,088, Cl. 166-192.000.

Owen, Calvin P. Pallet type packing system with a retractable walkway. 3,674,158, Cl. 214-16.1ce.

Owen, James Neal; Moberly, Raymond Ronald; Martin, Edwin J., Jr.; Yamada, Akemichi; and Thomas, Edmund C., to Wilcox Electric, Inc. Modulator for instrument landing system. 3,675,162, Cl. 337-23.000.

Owens-Corning Fiberglas Corporation: *See—*
Marzocchi, Alfred, 3,674,724.

Owens-Illinois, Inc.: *See—*
Shields, Dean W., 3,674,066.

Pacciarini, Antonio: *See—*
Caretta, Renato; and Pacciarini, Antonio, 3,674,899.

Padovani, Pietro, to I.S.A.P. SpA. Cupped trays made from a thin sheet of plastics material for round or pear-shaped fruits or horticultural products. 3,674,168, Cl. 217-26.500.

Padovani, Pietro. Pressure operated fastening means for containers. 3,674,295, Cl. 292-76.000.

Page, Richard W. Dental instrument operating system. 3,673,709, Cl. 32-22.000.

Paliwoda, Eugene J., to Jones & Laughlin Steel Corporation. Chill for direct casting of thin platelets. 3,674,084, Cl. 164-271.000.

Palka, Frank M.: *See—*
Ashley, James R.; and Palka, Frank M., 3,675,124.

Panigati, Pier L. Fluid operated sensor. 3,673,856, Cl. 73-37.500.

Panov, Alexei Alexandrovich: *See—*
Zykov, Vladimir Pavlovich; Panov, Alexei Alexandrovich; Prudnikov, Pavel Alexeevich; Khlopin, Mikhail Ivanovich; and Shlyapnikov, Alexel Dmitrievich, 3,675,087.

Papanastassion, Zion B.; and Neumeyer, John L., to Little, Arthur D., Inc., mesne. N-(2-fluoroethyl)-N-[2-(3-indole)ethyl] amines. 3,674,809, Cl. 260-326.150.

Papenfuss, Carl J.: *See—*
Manasian, Arthur E.; Papenfuss, Carl J.; and Piekarski, William F., 3,674,139.

Paper Converting Machine Co., Inc.: *See—*
Nystrand, Ernst Daniel, 3,674,608.

Papetti, Stelvio: *See—*
Obenland, Clayton O.; Papetti, Stelvio; and Smith, Hampton D., Jr., 3,674,853.

Parcell, Robert F., to Parke, Davis & Company. Oximes of 3,4-dimethoxyphenylpyruvic acid esters. 3,674,834, Cl. 260-471.00a.

Parisot, Andre; and Meimoun, Daniel, to Institut Textile de France. Method for processing cellulosic fibre material. 3,674,539, Cl. 117-56.000.

Park, Vernon K.: *See—*
Carter, Edward H., Jr.; Park, Vernon K.; and Seeger, Horst K., 3,674,765.

Park-Ohio Industries, Inc.: *See—*
Gillick, Jack W., 3,674,247.

Parke, Davis & Company: *See—*
Creger, Paul L., 3,674,836.
Fisher, Myron W.; and Hanessian, Stephen, 3,674,863.
Parcell, Robert F., 3,674,834.

Parker, Derek: *See—*
Jacobson, Sydney; Knowles, Denis; and Parker, Derek, 3,674,592.

Parker, Donald L.: *See—*
Bennett, Ronald W.; Parker, Donald L.; and Shaw, Arthur R., 3,675,197.

Parker, Fred W., to Du Pont de Nemours, E. I., and Company. Thermosetting acrylic enamel. 3,674,734, Cl. 260-31.20n.

Parker-Hannifin Corporation: *See—*
Davies, Robert H., 3,673,925.

Parks-Cramer Company: *See—*
Mulligan, William L., 3,675,097.

Parsons, Ronald W., to Allcock Laight and Westwood Limited. Expansible connector for joining tubes. 3,674,293, Cl. 287-56.000.

Pass, Arthur D. Abrading device for cleaning concave cylindrical surfaces. 3,673,747, Cl. 51-370.000.

Patel, Pravin K.; and Stone, Eliot, to National Cash Register Company, The. Formation of oxide coating on surface of a magnetic cobalt nickel alloy. 3,674,554, Cl. 117-237.000.

Path Computer Equipment Inc.: *See—*
Klockenbrink, Joseph M.; and Aydin, Kemal, 3,675,076.

Patrick, Henry W.: *See—*
Neeb, Robert P.; and Patrick, Henry W., 3,674,257.

Patton, Thomas H.: *See—*
Zagel, Samuel J.; and Patton, Thomas H., 3,675,006.

Paul, Bernt, to Siemens Aktiengesellschaft. Semiconductor type radiation detector. 3,675,018, Cl. 250-83.30r.

Paul, Ian Andrew, to Honeywell Inc. Control circuits for use in automatic control systems. 3,675,050, Cl. 307-304.000.

Paul, Jurgen: *See—*
Brugger, Franz; and Paul, Jurgen, 3,674,319.

Paz, Pascual S. Automatic occupied trip counting apparatus. 3,674,986, Cl. 235-30.00a.

Pearce, Shairyl I.: *See—*
Audiffred, Sidney J.; Johnson, Lowell E.; and Pearce, Shairyl I., 3,673,799.

Pearson, Anthony: *See—*
Pearson, William Michael; and Pearson, Anthony, 3,674,593.

Pearson, William Michael; and Pearson, Anthony, to Bondina Limited. Method of making a protective laminate having a interposed powdered layer. 3,674,593, Cl. 156-276.000.

Pease, Donald L.: *See—*
Baller, Ernst O.; Crandell, Melvin G.; Pease, Donald L.; and Witinski, Francis D., 3,674,363.

Pecorella, James. Multi-purpose carpet seam joining tool. 3,673,621, Cl. 7-8.000.

Pedersen, Harry, to Gleason Works, The. Self-cleaning chuck. 3,674,280, Cl. 279-2.000.

Peek, Henry L., to Allis-Chalmers Manufacturing Company. Circuit breaker with hydraulic operating mechanism for vacuum interrupter. 3,674,955, Cl. 200-82.000.

Peisner, Israel D.; Stol, George H.; and Gotcher, Eugene D., to Whitehead & Kales Company. Vehicle tie-down device. 3,673,969, Cl. 105-369.00a.

Pelousek, Herbert: *See—*

Schnegg, Robert; Pelousek, Herbert; Dippolhofer, Robert; Wiegreffe, Wolfgang; Voelz, Hans-Georg; and Kienast, Gerhard, 3,674,747.

Pennsylvania Industrial Chemical Corporation: *See*—
Vredenburgh, Walter A.; and Hollis, Samuel D., 3,674,723.

Penntube Plastics Company: *See*—
Ayella, Edmond R., 3,674,733.

Pennwalt Corporation: *See*—
Yochum, Daniel William; Haines, Paul Gordon; and Popoff, Ivan C., 3,674,701.

Penzel, Herbert W.: *See*—
Appleton, Norton A.; and Penzel, Herbert W., 3,675,007.

Pergaminos, Stavros. Method of making a filter for tobacco smoke. 3,674,540, Cl. 117-56.000.

Perkin-Elmer Corporation, The: *See*—
Offner, Abe, 3,674,334.

Perkins Engines Limited: *See*—
Stewart, William F., 3,673,651.

Perkins, James Frank: *See*—
Honey, Raymond; and Perkins, James Frank, 3,674,502.

Perkins Services N.V.: *See*—
Wilkinson, William H., 3,673,797.

Perl, Theodore. Light-proofed automatic radiographic cassette unloader-reloader. 3,675,014, Cl. 250-66.00.

Permutit Company Limited, The: *See*—
Arden, Thomas Victor; Borra, Albert George; and Clayton, Rolf Crowther, 3,674,685.

Persson, Leif R., to AB Billingsfors-Langed. Method of manufacturing a material similar to textile containing paper. 3,674,594, Cl. 156-299.000.

Peters, Joseph, Jr.; and Feeney, Brian P. Pitch change limiting device for stringed musical instruments. 3,674,909, Cl. 84-312.000.

Peters, Werner: *See*—
Schmalfeld, Paul; Janssen, Heinrich; Bock, Burkhard; Peters, Werner; and Ahland, Erwin, 3,674,449.

Peterser., George R., to Bowman, P. H., Company, Inc. Method of fabricating wood trusses. 3,673,671, Cl. 29-432.200.

Petersen, Ulrich; and Grandin, Friedrich-Hans, to Mannesmann Aktiengesellschaft. Method of rolling hollow stock. 3,673,836, Cl. 72-78.000.

Petrigalla, Andrew, to Smith, A. O., Corporation. Current sensing apparatus. 3,675,105, Cl. 318-356.000.

Petrolite Corporation: *See*—
Redmore, Derek, 3,674,804.

Petry, Robert K.; and Shortway, Harry A., to Congoleum Industries, Inc. Decorative surface coverings. 3,674,611, Cl. 161-63.000.

Petusky, Neil J., to Decision Data Corporation. Damping apparatus for a linear actuator device. 3,675,172, Cl. 335-257.000.

Pevrick Engineering Co., Inc.: *See*—
Hedrick, John R., 3,674,281.

Pfizer Inc.: *See*—
Beutel, Rolf Ernst; and Raaf, Helmut Wilhelm, 3,674,859.
Lombardino, Joseph G.; and Holland, Gerald F., 3,674,876.

Philip, Morris. Yarn creel and method of positioning yarn cones. 3,674,223, Cl. 242-131.000.

Philippson, Rainer; Hauser, Helmut; Gibian, Heinz; Kaspar, Emanuel; and Kessler, Hans-Joachim, to Schering AG. Unsaturated 22-guanidyl steroids. 3,674,815, Cl. 260-397.000.

Philips Petroleum Company: *See*—
Bjornson, Geir; and Fox, Homer M., 3,674,668.
Uraneck, Carl A.; and Trepka, William J., 3,674,753.

Phillips, Cecil E.; and Bennett, Fay M., to Saf-Pla Corporation. Tape and bandage cutter. 3,673,687, Cl. 30-294.000.

Phillips, Iris L.: *See*—
Phillips, Kenneth W.; and Phillips, Iris L., 3,674,911.

Phillips, John P. Electronic ignition. 3,673,998, Cl. 123-148.00e.

Phillips, Kenneth W.; and Phillips, Iris L. Drum body having integral mounting lugs for drumhead tensioning apparatus. 3,674,911, Cl. 84-411.000.

Phillips Petroleum Company: *See*—
Austin, Oliver K.; and Loewen, Bruno F., 3,674,437.
Box, E. O., Jr.; Drehman, Lewis E.; and Farha, Floyd E., Jr., 3,674,706.
Brady, Donnie G., 3,674,750.
Clay, Harris A., 3,674,887.
Gaeth, Rudolf H.; and Farrar, Ralph C., 3,674,895.
Hughes, William B., 3,674,661.
Kingslow, William G., Jr., 3,674,606.
Kraus, Gerard, 3,675,009.
Louthan, Rector P., 3,674,525.
Pritchard, James E., 3,674,915.
Spann, Donald C., 3,674,618.

Phlipot, Georges A.; Michiels, Marie-Jose-Suzanne and; and de Villeneuve, Yolande-Paule Marie-Josephe, to Eastman Kodak Company. Novel light-sensitive copolyesters. 3,674,745, Cl. 260-75.0va.

Phonocopy, Inc., mesne: *See*—
Salaman, Roy G.; and Picchiottino, John B., 3,674,922.

Photocircuits Corporation: *See*—
Burr, Robert Page, 3,674,914.
Keogh, Raymond J.; and Wilczek, Frank J., 3,674,602.

Picchiottino, John B.: *See*—
Salaman, Roy G.; and Picchiottino, John B., 3,674,922.

Pichel Industries, Inc.: *See*—
Levy, Stanley P., 3,675,078.

Pickard, Henry M. Hattersley. Electrically heated steam-raising autoclave. 3,674,981, Cl. 219-401.000.

Pickett, Oscar A., Jr.: *See*—
Ridgway, James S.; King, Henry L.; and Pickett, Oscar A., Jr., 3,674,752.

Pickholtz, Raymond L., to International Business Machines Corporation. Coherent single sideband phase locking technique. 3,675,131, Cl. 325-329.000.

Pickles, Joseph, to Ferro Manufacturing Crporation. Reclining seat adjuster. 3,673,891, Cl. 74-804.000.

Pickles, Joseph; and Fudala, Chester S., to Ferro Manufacturing Corporation. Tubular valve and body structure. 3,674,238, Cl. 251-309.000.

Piekarski, William F.: *See*—
Manasian, Arthur E.; Papenfuss, Carl J.; and Piekarski, William F., 3,674,139.

Pierce, Harold C. Boxed produce load. 3,673,812, Cl. 62-404.000.

Pieters, William Johan Meindert; Freel, John; and Anderson, Robert Bernard, to Grace, W. R., & Co. Regeneration of sulfur-poisoned Raney nickel catalyst. 3,674,707, Cl. 252-413.000.

Pihlblad, Robert W.: *See*—
Jayne, Max L.; and Pihlblad, Robert W., 3,675,186.

Pilkington Brothers Limited: *See*—
Loukes, David Gordon; and Edwards, Alan, 3,674,453.

Pinta Products, Inc.: *See*—
Pintarelli, Ralph, 3,673,815.

Pintarelli, Ralph, to Pinta Products, Inc. Easily clasped lock for earwire. 3,673,815, Cl. 63-12.000.

Pintschovius, Ulrich: *See*—
Schinzel, Erich; Pintschovius, Ulrich; and Lebkucher, Karl Heinz, 3,674,781.

Pioneer Electronic Corporation: *See*—
Ohshita, Masahide; and Tsukagoshi, Tsunehiro, 3,674,549.

Pioneer Research, Inc.: *See*—
Goldberger, Max, 3,673,801.

Pitteway, Michael Lloyd Victor, to National Research Development Corporation. Apparatus for decoding graphic-display information. 3,675,230, Cl. 340-324.00a.

Pittman, Allen G.; and Wasley, William L., to United States of America, Agriculture. Fluorinated alcohols and their esters. 3,674,820, Cl. 260-408.000.

Pittway Corporation: *See*—
Evesque, Roger A., 3,674,185.
Ewald, Ronald F., 3,674,186.

Pitzalis, Mario; Vargiu, Silvio; and Nistri, Ugo, to Societa Italiana Resine S.p.A. Rosin modified phenolic resins and method of preparing same. 3,674,732, Cl. 260-25.000.

Place, Donald E., to Therm-O-Disc, Incorporated. Manual reset thermostat. 3,675,178, Cl. 337-348.000.

Plasse, Paul A., to Polaroid Corporation. Novel laminating media. 3,674,622, Cl. 161-160.000.

Plate, Geerardus G.; and Van Hattem, Nicolaas. Bag-making machine. 3,673,879, Cl. 74-125.500.

Plaxin, Vladimir Nikolaevich: *See*—
Voitsekhovsky, Bogdan Vyacheslavovich; Zuev, Alfred Alexandrovich; Plaxin, Vladimir Nikolaevich; and Makarov, Valery Nikolaevich, 3,673,849.

Plepys, Raymond A.: *See*—
Larsen, Eric R.; Keller, Albert Kent; and Plepys, Raymond A., 3,674,664.

Plessey Handel und Investments A.G.: *See*—
Guest, Ashley W., 3,675,139.

Pleuger, Friedrich-Wilhelm, to Pleuger Unterwasserpumpen GmbH. Submersible electric motor. 3,675,057, Cl. 310-68.00d.

Pleuger Unterwasserpumpen GmbH: *See*—
Pleuger, Friedrich-Wilhelm, 3,675,057.

Plichta, Dietmar G., to Kaiser Aluminum & Chemical Corporation. Workpiece reclaiming apparatus. 3,673,899, Cl. 83-4.000.

Plouzek, Eugene A.: *See*—
McMurray, Mitchell; Plouzek, Eugene A.; and Sturges, James R., 3,674,279.

Plumat, Emile; and Toussaint, Francois, to Glaverbel S.A. Ion exchange of glass with use of carbon dioxide. 3,674,454, Cl. 65-30.000.

Podhora, Fred W.: *See*—
Michel, Raymond S.; and Podhora, Fred W., 3,674,011.

Podmore, Alan William Ronald, to AMP Incorporated, mesne. Flat cable connector. 3,675,180, Cl. 339-17.00f.

Polanyi, Michael L., to American Optical Corporation. Fiberoptic catheter. 3,674,013, Cl. 128-2.05d.

Polaroid Corporation: *See*—
Coughlan, Edward H., 3,673,935.
Grasshoff, J. Michael; and Taylor, Lloyd D., 3,674,478.
Haberlin, Richard J., 3,674,482.
Heijenga, Berend, 3,673,844.
Moodie, Donald E., 3,674,965.
Plasse, Paul A., 3,674,622.

Polinsky, Ronald J.: *See*—
Post, Arthur H., Jr.; Polinsky, Ronald J.; and Dwyer, James L., 3,674,678.

Polyflon Corporation: *See*—
Russo, Paul; and Mowogrozki, Markus, 3,675,093.

Pomara, Johnny B., Jr., 1/2 to El Chico Corporation. Apparatus for measuring and dispensing particulate material. 3,674,178, Cl. 222-56.000.

Pool, Richard L.: *See—*
Krengel, Theodore H.; and Pool, Richard L., 3,673,980.

Pope, Joseph Albert: *See—*
van-der-Ben, Charles Robert; and Pope, Joseph Albert, 3,674,576.

Popoff, Ivan C.: *See—*
Yochum, Daniel William; Haines, Paul Gordon; and Popoff, Ivan C., 3,674,701.

Poppe, Wassily: *See—*
Khelghatian, Habet M.; and Poppe, Wassily, 3,674,536.

Porter, Donald E.; and Burkholder, Jack, to Water and Gas Plastics Products. Plastic valve. 3,674,235, Cl. 251-162.000.

Porter, Kenneth; and Richardson, Brian, to Imperial Chemical Industries Limited. Polycondensation in poly(tetrafluoroethylene) reactor. 3,674,744, Cl. 260-75.00m.

Posse, Rolf-Fred: *See—*
Moll, Franz; Posse, Rolf-Fred; and Ringe, Werner, 3,674,703.

Post, Arthur H., Jr.; Polinsky, Ronald J.; and Dwyer, James L., to Millipore Corporation. Electrophoretic apparatus. 3,674,678, Cl. 204-299.000.

Postma, Lambertus: *See—*
Jonker, Hendrik; Janssen, Casper Johannes Gerardus Ferdinand; and Postma, Lambertus, 3,674,485.

Potlatch Forests, Inc.: *See—*
McMinimy, Lawrence O., 3,674,596.
Pottenger, Charles R., 3,674,434.

Pottenger, Charles R., to Potlatch Forests, Inc. Method and apparatus for determining lignin content. 3,674,434, Cl. 23-230.00r.

Powell, Carl G.: *See—*
Harris, Erik P.; Lean, Eric G.; and Powell, Carl G., 3,675,150.

Power, Gerald P., to Honeywell Inc. Reserve battery having the electrolyte compartment moved by gas pressure. 3,674,566, Cl. 136-114.000.

Powers, John. Drainage system for body cavities. 3,674,033, Cl. 128-350.00r.

PPG Industries, Inc.: *See—*
Dean, Warren E.; and Dorsett, Charles M., 3,674,428.
Erikson, J. Alden; and Gacesa, Gerald R., 3,674,670.
Miller, Richard G., 3,674,517.
Vanderbilt, Byron M.; and Fasnacht, James J., 3,674,542.

Practical Innovations, Inc.: *See—*
Martinsen, Lyle J., 3,674,503.

Pratt, David S.: *See—*
Miehle, James A.; Pratt, David S.; and Rees, Robert M., 3,675,204.

Prenihan A.G., mesne: *See—*
Johnson, Martin Robert, 3,673,821.

Prete, John A.; and Raudat, John L., to Emhart Corporation. Apparatus for simultaneously loading groups of articles into packing cases. 3,673,756, Cl. 53-61.000.

Preysch, Fritz, to Rieter Machine Works, Ltd. Process for changing supply spools and finish wound cops on draw-twisting and draw-winding machines. 3,673,784, Cl. 57-156.000.

Price, Alson K.: *See—*
Sweeney, Richard F.; Khan, Aziz Urrehman; Price, Alson K.; Jones, Edward Stephen; and Otto, Julian A., 3,674,800.

Price, Alson K.; and Sukornick, Bernard, to Allied Chemical Corporation. Polyfluoroisoalkoxyalkyl pyridinium salts. 3,674,798, Cl. 260-297.00r.

Price, H. C., Co.: *See—*
Harris, Robert J.; and Lee, Irvin J., 3,674,546.

Pricer, W. David: *See—*
Bossen, Douglas C.; Henle, Robert A.; Hsiao, Mu Y.; Maley, Gerald A.; and Pricer, W. David, 3,675,200.

Prill, Arnold L.; and Tarkan, Stuart E., to Chromalloy American Corporation. Tungsten carbide dispersion in age-hardenable cupronickel. 3,674,575, Cl. 148-32.500.

Pritchard, James E., to Phillips Petroleum Company. Electrical cable having an ethylene-1-olefin copolymer as the dielectric material. 3,674,915, Cl. 174-102.00r.

Probat-Werke von Gimborn & Co. K.G.: *See—*
Schabbel, Roland, 3,673,700.

Process Services Inc.: *See—*
Yearout, James D.; and Tolbert, Richard E., 3,674,355.

Procopio, Antonio. Heel wedge for shoe. 3,673,714, Cl. 36-81.000.

Procter & Gamble Company, The: *See—*
Riemersma, Coenraad E., 3,674,221.

Proektnokonstruktorsky Institute Metallurgicheskogo Mashinostroeniya: *See—*
Tselikov, Alexandr Ivanovich; Nosal Vsevolod Vladimirovich; and Verderevsky, Vadim Anatolievich, 3,673,840.

Propst, Robert L. Furniture construction. 3,674,230, Cl. 248-188.800.

Prudnikov, Pavel Alexeevich: *See—*
Zykov, Vladimir Pavlovich; Panov, Alexei Alexandrovich; Prudnikov, Pavel Alexeevich; Khlopin, Mikhail Ivanovich; and Shlyapnikov, Alexei Dmitrievich, 3,675,087.

Prut, Alfred Iosifovich: *See—*
Alperovich, Viktor Borisovich; and Prut, Alfred Iosifovich, 3,673,866.

Pryjmak, Bohdan I., to General Motors Corporation. Electronic demand windshield wiper control. 3,675,106, Cl. 318-443.000.

Pryor, Michael J.; and Anthony, William H., to Olin Mathieson Chemical Corporation. Method of making a composite cable sheathing having an aluminum-silicon layer. 3,674,569, Cl. 148-11.50a.

Prytkov, Evgeny Fedorovich. Tubular incandescent lamp. 3,675,070, Cl. 313-279.000.

Puddington, Ira Edwin: *See—*
Farnand, Joseph Redmond; and Puddington, Ira Edwin, 3,674,461.

Pullen, Eric V.: *See—*
Manoogian, Alex; and Pullen, Eric V., 3,674,048.

Purcell, Chester L.; and Smarook, Walter H., to Union Carbide Corporation. Bonding with ammonium polymer salts. 3,674,896, Cl. 260-897.00b.

Purcell, Harold K.: *See—*
Schwartz, Leonard; Purcell, Harold K.; and Wieselman, Jerome J., 3,674,688.

Puxbaumer, Hans: *See—*
Schleppinghoff, Bernhard; Scherb, Helmut; and Puxbaumer, Hans, 3,674,883.

Quase, Harold G., to Underwater Storage, Inc. Storm sewage treatment. 3,674,687, Cl. 210-86.000.

Quenot, Andre, to Manufacture Quenot Mabo. Folding measuring instrument with improved linkage members. 3,673,692, Cl. 33-118.000.

Questa, Charles R.: *See—*
Trost, Joseph C.; Bock, Robert V.; Gerbstadt, Frederick H.; Graham, William J.; Miles, Wilson D.; and Questa, Charles R., 3,675,209.

Quigley, John A.: *See—*
Beddows, Norman A.; Quigley, John A.; and Wielt, Warren P., 3,675,058.

R. I. Patents, Inc.: *See—*
Margrave, John L.; Badachhape, Ramachandra B.; Wood, James L.; and Lagow, Richard J., 3,674,432.

Raaf, Helmut Wilhelm: *See—*
Beutel, Rolf Ernst; and Raaf, Helmut Wilhelm, 3,674,859.

Racal-Mobilcal Limited: *See—*
Brown, Anthony R., 3,675,176.

Rachlin, Joel R.; and Neudek, Rudolph Otto. Ventilating air distributing channel. 3,673,945, Cl. 98-40.00d.

Radding, Jason D., to Crown Imports Co., Inc. Chair. 3,674,308, Cl. 297-345.000.

Radscheit, Kurt: *See—*
Stache, Ulrich; Radscheit, Kurt; Fritsch, Werner; Haede, Werner; and Lindner, Ernst, 3,674,779.

Raes, Maurice C.: *See—*
Early, Robert M.; and Raes, Maurice C., 3,674,718.

RAF Corporation: *See—*
Chang, Charles H.; and Randall, David I., 3,674,856.

Ragland, Douglas, to Texas Inventment Builders Co. Air diffuser. 3,673,946, Cl. 98-40.00d.

Ragualt, Beatrice. Immersion heater element. 3,674,985, Cl. 219-523.000.

RAI Research Corporation: *See—*
Tuwiner, Sidney B., 3,674,669.

Raiff, Lawrence C.: *See—*
Fischer, Robert E.; Raiff, Lawrence C.; Seybold, James M.; and Zimmerle, Donald F., 3,674,924.

Rainer, Norman B., to Morris, Philip, Incorporated. Process for the removal of oil from the surface of a body of water. 3,674,683, Cl. 210-40.000.

Rainer, Norman B.; and Wilson, Peter A., to Morris, Philip, Incorporated. Microporous structure and method of making the same. 3,674,722, Cl. 260-2.50m.

Rajappa, Srinivasachari, to Ciba-Geigy Corporation. 6-Amino-4-oxo-4,5-dihydro-isothiazolo [5,4-d] pyrimidines. 3,674,786, Cl. 260-247.100.

Rakow, Marvin S.: *See—*
Filachek, Lawrence A.; and Rakow, Marvin S., 3,674,450.

Rama Industrial Heater Co.: *See—*
Hoyt, Edwin D.; and Welsh, Luther, 3,674,982.

Ramey, Leslie C. Windrow attachment for mowers. 3,673,778, Cl. 56-320.200.

Ramillon, Rene. Mounting of wheels on ski poles. 3,673,911, Cl. 85-36.000.

Ramnas Bruks Aktiebolag: *See—*
Sveksson, Stig, 3,673,646.

Ranco Incorporated: *See—*
Adams, Jay C.; and Cook, Russell E., 3,673,811.

Randall, David I.: *See—*
Chang, Charles H.; and Randall, David I., 3,674,856.

Randle, Walter N.; Spieth, Howard H.; and English, William D., to United States of America, Air Force. Portable liquid gas sampler system. 3,673,871, Cl. 73-421.00r.

Randolph, Robert W.; and Dare, Roy R., to ACF Industries, Incorporated. Draft key retainer lock for railway cars. 3,673,914, Cl. 85-5.00n.

Ranz, Erwin: *See—*
Kampfer, Helmut; von Konig, Anita; Ranz, Erwin; von Rintelen, Harald; Mayer, Dietmar; and Sasse, Klaus, 3,674,479.
Kampfer, Helmut; Von Konig, Anita; Ranz, Erwin; von Ritelen, Harald; Mayer, Dietmar; and Sasse, Klaus, 3,674,480.

Rao, Velliyur Nott Padmanabha; Scott, John A.; and Surowiecki, Benjamin M., Jr., to Olin Mathieson Chemical Corporation. Preparation of aromatic isocyanates. 3,674,827, Cl. 260-453.0pc.
Raphael, Leon. Instantaneous sinusoidal orthogonal converter. 3,675,137, Cl. 328-144.000.
Raschle, Josef, to Moulinage & Retorderie de Chavanoz, mesne. Magnetic false twist spindle. 3,673,782, Cl. 57-77.450.
Ratner, George I., to Automatic Close & Lock Corporation. Security locking device. 3,674,360, Cl. 312-222.000.
Ratouis, Roger: *See*—
Boissier, Jacques Robert; and Ratouis, Roger, 3,674,841.
Raudat, John L.: *See*—
Prete, John A.; and Raudat, John L., 3,673,756.
Rausch, John J.: *See*—
Van Thyne, Ray J.; and Rausch, John J., 3,674,571.
Van Thyne, Ray J.; and Rausch, John J., 3,674,572.
Van Thyne, Ray J.; and Rausch, John J., 3,674,573.
Van Thyne, Ray J.; and Rausch, John J., 3,674,574.
Raviv, Josef, to International Business Machines Corporation. Data compaction using modified variable-length coding. 3,675,211, Cl. 340-172.500.
Raviv, Josef; and Wesley, Michael A., to International Business Machines Corporation. Data compaction using variable-length coding. 3,675,212, Cl. 340-172.500.
Ray and Gilbert Proprietary Limited: *See*—
Gilbert, Leslie Arthur, 3,673,691.
Ray, Charles W. Sealing construction for gas mains and the like. 3,674,055, Cl. 138-89.000.
Raynor, Terence Robert: *See*—
Kindell, Colin David; and Raynor, Terence Robert, 3,673,665.
Raytheon Company: *See*—
Hands, Edward, 3,674,945.
Israel, Henry M., 3,675,116.
O'Loughlin, James P., 3,675,115.
RCA Corporation: *See*—
Athanas, Terry George, 3,674,551.
Bonnette, Richard Arthur, 3,673,652.
Caprarola, Leroy J., 3,674,568.
Castellano, Joseph Anthony; and Friel, Ronald Norman, 3,674,342.
Dodd, John Alton, Jr.; and Line, George Harry, 3,674,488.
Goldsmith, Alfred Norton, 3,674,921.
Griepentrog, Dal Frank, 3,674,932.
Kiess, Helmut Gustav, 3,675,096.
Lehmann, William Lester, 3,675,095.
Luedicke, Eduard; and Silver, Robert Steven, 3,675,134.
Strater, Kurt; Hall, William Bernard; Mihalick, Eugene Michael; and Stever, William Charles, 3,673,983.
Zuk, Borys, 3,675,144.
Reddemann, Bernhard Hermann: *See*—
Laue, Hans-Jurgen Rainer; Bohm, Horst Otto; and Reddemann, Bernhard Hermann, 3,674,470.
Rederiaktiebolaget Nordstjernan: *See*—
Jonsson, Per Hjalmar, 3,674,370.
Redmond John A.: *See*—
Emerson, William A.; and Redmond John A., 3,674,971.
Redmore, Derek, to Petrolite Corporation. Imidazoline phosphonic acids. 3,674,804, Cl. 260-309.600.
Reed, Everett E.; and Boynton, James S., to United Tool Processes Corporation. Valve-guide coring tool. 3,674,375, Cl. 408-103.000.
Reel Vortex, Inc.: *See*—
Ferguson, Hugo S., 3,673,773.
Rees, Robert M.: *See*—
Miehle, James A.; Pratt, David S.; and Rees, Robert M., 3,675,204.
Reese, Dale C. Method and apparatus for stimulating the flow of oil wells. 3,674,093, Cl. 166-299.000.
Regie Nationale des Usines Renault: *See*—
Eydieux, Marius, 3,673,655.
Froumajou, Armand; and Falay, Bernard, 3,673,882.
Mangin, Jean-Pierre, 3,673,995.
Richard, Gilbert; and Moronval, Gerard, 3,675,033.
Tixier, Michel, 3,673,837.
Reichhold-Albert-Chemie Aktiengesellschaft: *See*—
Guldenpfenning, Rolf, 3,674,731.
Reifschneider, Walter, to Dow Chemical Company, The. (Alkylthio)alkyl(thio)phenols. 3,674,857, Cl. 260-609.00f.
Reimers, Eberhart. Asynchronous generator device. 3,675,117, Cl. 322-31.000.
Reinhall, Rolf Bertil. Pulp fiberizing grinding plate. 3,674,217, Cl. 241-21.000.
Reinhardt, Dieter: *See*—
Kunke, Arthur; Reinhardt, Dieter; and Glass, Waldemar, 3,675,023.
Reis, Bernhard: *See*—
Becker, Werner; Farwer, Alfward; Frank, Georg; Reis, Bernhard; Rohf, Josef; and Auer, Rupert, 3,674,978.
Reisacher, Josef; Noltemeyer, Friedrich; and Dziggel, Reiner, to Daimler-Benz Aktiengesellschaft. Reciprocating piston internal combustion engine with a cylinder head and cylinder housing consisting of one block. 3,674,000, Cl. 123-193.000.
Reitinger, Johann: *See*—
Mayer Rolf; and Reitinger, Johann, 3,674,977.
Remington Arms Company, Inc.: *See*—
Hameister, Harold L.; and Baszczuk, Andrew R., 3,674,451.
Renga, Fred L.: *See*—
Bristol, Thomas R.; Lakin, Harold; and Renga, Fred L., 3,674,142.
Reni, Cesare; Gualdi, Giorgio; and Lugo, Luigi, to Societa Italiana Resine S.p.A. Method of producing aromatic carboxylic acids from alkylbenzenes. 3,674,845, Cl. 260-524.00r.
Rennick, Leonard E., to Sun Oil Company. Process for preparation of methylcyclopentane and methylcyclohexanecarboxylic acids and esters. 3,674,831, Cl. 260-468.0cb.
Republic National Bank of Dallas Irving Trust Company and Union Bank: *See*—
Coats, John C.; and Wilson, George W., III, 3,674,984.
Research-Cottrell, Inc.: *See*—
Leonard, Gerald D., 3,673,768.
Rethwish, William F., to Rohr Corporation. Non-tilting probe. 3,673,695, Cl. 33-174.00l.
Revlon, Inc.: *See*—
Schwarz, Milton H.; and Goldberg, Marvin E., 3,674,631.
Reynolds, Carole A.: *See*—
Benjamin, Thaer L.; and Reynolds, Carole A., 3,674,270.
Reynolds Metals Company: *See*—
Arfert, Horst F. W., 3,673,835.
Brunner, Hans A.; and Vogeleer, George B., 3,673,834.
Dewey, Raymond D.; Mapes, Robert S.; and Jones, Garth S., 3,674,926.
Reynolds, R. J., Tobacco Company: *See*—
Bluhm, Herbert J.; and Fluck, Eugene R., 3,674,806.
Reynolds, Richard W. Sectionalized pontoon apparatus. 3,673,976, Cl. 114-61.000.
Rheiner, Alfred, Jr.; Fernex, Michel; and Herrero, Jose, to Hoffmann-La Roche Inc. Antimalarial compositions. 3,674,872, Cl. 424-229.000.
Rhiando, Maxwell Alvin Earl. Moulding apparatus. 3,674,395, Cl. 18-4.00p.
Rhone-Poulenc S.A.: *See*—
Commarmot, Roger, 3,674,236.
Fabre, Albert, 3,674,628.
Ricci, Vero; and Colalillo, Edward P. Traveling cylinder printer with platen roller driven in closed path. 3,673,960, Cl. 101-269.000.
Richard, Gilbert; and Moronval, Gerard, to Automobiles Peugeot and Regie Nationale des Usines Renault. Device for starting and stopping a diesel engine. 3,675,033, Cl. 290-38.000.
Richardson, Brian: *See*—
Porter, Kenneth; and Richardson, Brian, 3,674,744.
Richardson Company, The: *See*—
Noone, Thomas M., 3,674,547.
Richardson, Howe Scale Company: *See*—
Gile, Richard H., 3,674,097.
Richardson, Wallace L.; Kautsky, George J.; and Barusch, Maurice R., to Chevron Research Company. Antiknock tetramethyl lead concentrate. 3,674,826, Cl. 260-437.00s.
Richmon, Sidney. Automatic elevator stopping apparatus. 3,674,113, Cl. 187-29.00r.
Richmond Marine Limited: *See*—
Thorpe, David, 3,674,170.
Richter, Frederic A.: *See*—
Winsler, Robert J.; and Richter, Frederic A., 3,673,735.
Richter, Gerhard; Kroes, Magdalena; and Frietzsche, Angelika, to Siemens Aktiengesellschaft. Raney mixed catalyst. 3,674,710, Cl. 252-465.000.
Rick, Edward A.: *See*—
Fitton, Peter; and Rick, Edward A., 3,674,825.
Rick, Frank G. Cutting head for a chamfering tool. 3,673,654, Cl. 29-97.000.
Ricoh Co., Ltd.: *See*—
Iwamoto, Minoru, 3,675,228.
Kurokawa, Junji; Arai, Fumiaki; and Usui, Noriyuki, 3,674,474.
Ridgway, James S.; King, Henry L.; and Pickett, Oscar A., Jr., to Monsanto Company. Copolyamides from 1,6- or 2,6-naphthalene dicarboxylic acid. 3,674,752, Cl. 260-78.00r.
Riek, Siegfried: *See*—
Streicher, Heinz; Riek, Siegfried; and Leutwein, Manfred, 3,674,351.
Riemersma, Coenraad E., to Procter & Gamble Company, The. Dynamic stress-strain testing of ribbons of film. 3,674,221, Cl. 242-75.510.
Rieter Machine Works, Ltd.: *See*—
Preysch, Fritz, 3,673,784.
Rigby, Charles Herbert, to Imperial Chemical Industries Limited. Shotgun powder package. 3,673,964, Cl. 102-39.000.
Riley, Norman: *See*—
Averill, Frederick John; and Riley, Norman, 3,674,852.
Rimkus, Elsa: *See*—
Rimkus, Hans, 3,674,586.
Rimkus, Hans; deceased (Rimkus, Elsa; sole heir), to Siemens Aktiengesellschaft. Method for producing metal-to-ceramic junctions. 3,674,586, Cl. 156-196.000.
Ringe, Werner: *See*—
Moll, Franz; Posse, Rolf-Fred; and Ringe, Werner, 3,674,703.
Rink, Richard H., to Huron Manufacturing Corporation. Sensing control for a road building machine. 3,675,229, Cl. 340-267.00r.
Ripsco, William B.; and Dietrich, John W., to Whirlpool Corporation. Door latch and interlock. 3,673,824, Cl. 68-12.00r.
Ristic, Miodrag: *See*—
Welter, Clarence J.; and Ristic, Miodrag, 3,674,860.

RLR Chemical Company, Inc.: *See—*
Schwartz, Leonard; Purcell, Harold K.; and Wieselman, Jerome J., 3,674,688.

Robbins, Samuel B., to General Motors Corporation. Power window reversing unit. 3,675,101, Cl. 318-266.000.

Robelen, Russell J.: *See—*
Dauber, Philip S.; Robelen, Russell J.; and Wierzbicki, John R., 3,675,217.

Roberts, Bisset J. Vehicle ambulance. 3,674,167, Cl. 214-505.000.

Roberts Consolidated Industries, Inc.: *See—*
Holman, John G., 3,674,590.

Roberts, Robert D., to Houdaille Industries, Inc. Centralized lubrication system. 3,674,112, Cl. 184-6.100.

Roberts, Robert J. Electrically energized petroleum de-emulsifier. 3,674,677, Cl. 204-302.000.

Robertson Manufacturing Company, Inc.: *See—*
Robertson, Richard W., 3,673,722.

Robertson, Richard W., to Robertson Manufacturing Company, Inc. Frame construction for displaying pictures and the like. 3,673,722, Cl. 40-152.000.

Robinson, George Henry, to Hygena Limited. Furniture construction. 3,674,327, Cl. 312-257.00.

Robinson, Raymond E., to Blaw-Knox Foundry & Mill Machinery, Inc. Strip tension sensing device. 3,674,193, Cl. 226-100.000.

Robison, Robert S.: *See—*
Aszalos, Adorjan; Robison, Robert S.; Kraemer, Nancy; Henshaw, Jo Ann; and Giannini, Mary Suzanne, 3,674,867.

Robson, Harry Edwin, to Esso Research and Engineering Company. Process for preparing a synthetic crystalline zeolite. 3,674,425, Cl. 23-113.000.

Roche, Andre. Spray-gun control. 3,674,182, Cl. 222-193.000.

Roeder, Robert J., to Kimberly-Clark Corporation. Method for applying pressure sensitive adhesive to sanitary napkins. 3,674,595, Cl. 156-306.000.

Rogers, Kendal T.: *See—*
Spindt, Charles A.; and Rogers, Kendal T., 3,675,063.

Rohde, Robert P.; Welsh, Clarence E.; and Engelhardt, Hans, to General Motors Corporation. Fluid vane motor. 3,674,385, Cl. 418-177.000.

Rohf, Josef: *See—*
Becker, Werner; Farwer, Alfward; Frank, Georg; Reis, Bernhard; Rohf, Josef; and Auer, Rupert, 3,674,978.

Rohner, Friedbert R. Motion transforming device for producing a reciprocating motion. 3,673,876, Cl. 74-37.000.

Rohr Corporation: *See—*
Cadwell, Gilbert C., 3,673,833.
Macdonald, Howard R., 3,673,803.
Rethwish, William F., 3,673,695.

Rohr, Robert Lewis: *See—*
Grandia, Johannes; and Rohr, Robert Lewis, 3,674,004.

Rolatape Corporation: *See—*
Evans, Wallace D., Jr., 3,673,693.

Romanauskas, William A.: *See—*
Mitchell, David F.; and Romanauskas, William A., 3,674,197.

Romanuk, Miroslav; Slama, Karel; and Sorm, Frantisek, to Ceskoslovenska akademie ved. Process of preparing esters of 3,7,11-trimethyl-7,11-dichloro-2-dodecene-1-oic acid. 3,674,819, Cl. 260-408.000.

Romer, Gerhard. Method for compacting fodder or the like. 3,673,951, Cl. 100-38.000.

Ronson Corporation: *See—*
Cox, Ernest Francis, 3,674,980.
Troisoeufs, Pierre, 3,674,412.

Roos, Jan, to U.S. Philips Corporation, mesne. Thin tape or foil made of an electrically insulating synthetic material. 3,674,629, Cl. 161-214.000.

Rose, Henry J.; Turbak, Albin F.; and Leahy, Thomas E., Jr., to Tee-Pak, Inc. Treatment of sausage casing for easy peeling. 3,674,511, Cl. 99-176.000.

Rose, Henry J.; and Turbak, Albin F., to Tee-Pak, Inc. Oil modified cellulosic sausage casings. 3,674,523, Cl. 106-168.000.

Rose, Robert C., to Rosemount Engineering Company. Two-wire current transmitter employing a stabilized current source in one electrical circuit containing control means in series therewith for controlling a direct current amplifier contained in a parallel circuit. 3,675,122, Cl. 324-62.000.

Rosemount Engineering Company: *See—*
Rose, Robert C., 3,675,122.

Rosemount Inc.: *See—*
Serrano, Leonardo V., 3,674,963.

Rosenberg, Daniel: *See—*
Francini, Joseph Pirra; Braxton, James Lopez, Jr.; Lewis, Vera Gloria; McPherson, Frank Henderson; Rosenberg, Daniel; and Sekse, Torkjell, 3,674,988.

Rospatch Corporation: *See—*
Templeton, John Glenn, 3,674,614.

Roth-American, Inc.: *See—*
Tomalinas, William R., Jr., 3,674,262.

Rottmiller, Edmund H., to Stromberg Datagraphix, Inc. Image combining optical system. 3,673,932, Cl. 95-1.100.

Rowe International Inc.: *See—*
Scarnecchia, Gregory; and Scalera, Frank T., 3,674,173.

Ruehlemann, Herbert E.; and Wontorsky, Alexander, to Elco Corporation. Electrical connectors for distribution plate and rack and panel applications. 3,675,185, Cl. 339-126.0rs.

Ruekberg, Herbert S., to Continental Can Company, Inc. Apparatus for filling and adjusting the contents level in flexible containers. 3,674,060, Cl. 141-83.000.

Ruhrchemie AG: *See—*
Gothel, Herbert; and Feichtinger, Hans, 3,674,692.

Ruiz, Jose Antonio. Hinge that takes to pieces. 3,673,636, Cl. 16-175.000.

Rushton, John R., to Bell Telephone Laboratories, Incorporated. Method for applying metal contacts onto diode array. 3,674,498, Cl. 96-119.000.

Russo, Paul; and Mowogrozki, Markus, to Polyflon Corporation. Variable capacitor. 3,675,093, Cl. 317-249.00r.

Russo, Ronald D.: *See—*
Miller, Merlin S.; and Russo, Ronald D., 3,674,148.

Rutledge, Nolan W.; Mercer, Ronald H.; and Hill, Herbert Charles, Jr. Wire coating process and apparatus. 3,673,982, Cl. 118-641.000.

Rutz, Hans; and Gubler, Kurt, to Ciba-Geigy Corporation. Insecticidal and acaricidal compositions. 3,674,874, Cl. 424-273.000.

Ruyle, William V.: *See—*
Shen, Tsung-Ying; Ruyle, William V.; Witzel, Bruce E.; and Walford, Gordon L., 3,674,875.

Ruyle, William V.; Sarett, Lewis H.; and Matzuk, Alexander R., to Merck & Co., Inc. Phenyl benzoic acid compounds in compositions and methods for treating inflammation. 3,674,870, Cl. 424-230.000.

Ryabtsev, Pavel Sergeevich: *See—*
Sidorov, Oleg Pavlovich; Ryabtsev, Pavel Sergeevich; Lastochkin, Rostislav Ivanovich, deceased; Lastochkina, Nadezhda Andreevna; and Lastochkina, Tatyana Rostislavovna, 3,675,102.

Ryan, Joseph D.: *See—*
Beckham, Robert R.; Walters, Emmett L.; Brown, Jack G.; De Rose, Kenneth M.; and Ryan, Joseph D., 3,673,981.

Ryan, Patrick W.: *See—*
Verdol, Joseph A.; and Ryan, Patrick W., 3,674,743.

S. A. Monk Sutton-in-Ashfield Limited: *See—*
Swanwick, Barry Frederick; West, Ernest; and Cuthbertson, John Harry, 3,673,819.

S.A. Sodialox: *See—*
Catulle, Lyderic G., 3,673,674.

S.A. Telecommunications Radioelectriques et Telephoniques T.R.T.: *See—*
Bellanger, Maurice Georges; Daguet, Jacques Lucien; and Duong, Tuan Kiet, 3,674,937.

Saf-Pla Corporation: *See—*
Phillips, Cecil E.; and Bennett, Fay M., 3,673,687.

Safe Way Hydraulics, Inc.: *See—*
Stratman, Paul E., 3,674,051.

Sagawa, Burt K., to Minnesota Mining and Manufacturing Company. Lithographic duplicating method and lithoplate master therefor. 3,673,962, Cl. 101-467.000.

Sage, Stanley J., to American Optical Corporation. Blood coagulation detection device. 3,674,012, Cl. 128-2.10r.

Sagi, Zsigmond, to Bio-Medical Sciences, Inc. Device for holding and dispensing thermometers. 3,674,176, Cl. 221-135.000.

Sakai Chemical Industry Company Limited: *See—*
Tada, Fusao; Inamine, Seiei; and Hatanaka, Tsutomu, 3,674,897.

Sakai, Kiyoshi: *See—*
Kubo, Keishi; and Sakai, Kiyoshi, 3,675,013.

Sakai, Masaaki: *See—*
Ninomiya, Shoichi; Sakai, Masaaki; Oka, Sakae; and Kusunoki, Kikunobu, 3,675,224.

Sakai, Takamasa: *See—*
Seko, Maomi; Ogawa, Shinsaku; Komori, Ryozo; Asuma, Masaro; Isoya, Toshiro; and Sakai, Takamasa, 3,674,653.

Sakka, Toshikatsu; and Takano, Kiyoshi. Automatic DC voltage regulating system. 3,675,111, Cl. 321-18.000.

Salaman, Roy G.; and Picchiottino, John B., to Phonocopy, Inc., mesne. Synchronized or unsynchronized partial response binary signalling. 3,674,922, Cl. 178-6.000.

Salvo Tool & Engineering Company: *See—*
Bedker, Bruce D.; and Wunderlich, Frederich C., 3,673,832.

Sampath, Prativadi I.: *See—*
Artaud, Maurice H.; Johnson, Ronald W.; and Sampath, Prativadi I., 3,674,354.

Samson, Julie Marie, to Subbuteo Sports Games Limited. Random number selector. 3,674,275, Cl. 273-138.00r.

Samuelsson, Lars-Gunnar: *See—*
Wennergren, Johan Jakob; and Samuelsson, Lars-Gunnar, 3,674,632.

Sanchez, Anastacio V. Method of and apparatus for repairing deformed yieldable structures. 3,673,842, Cl. 72-293.000.

Sanderson, Dewey S. C. Cabinet for storing microscopic slides. 3,674,358, Cl. 312-126.000.

Sandoz A.G.: *See—*
Bormann, Gerhard; Gmunder, John; Wilkens, Heinrich; and Troxler, Franz, 3,674,801.
Entschel, Roland; and Steinemann, Willy, 3,674,772.

Sandoz Ltd.: *See –*
Bormann, Gerhard; Gmunder, John; Wilkens, Heinrich; and Troxler, Franz, 3,674,801.
Entschel, Roland; and Steinemann, Willy, 3,674,772.
Von Tobel, Hans, 3,674,783.

Sandoz-Wander, Inc.: *See—*
Buzzolini, Mario G., 3,674,807.
Houlihan, William J., 3,674,882.

Sandrud, Torsten: *See—*
Gustafson, Manfred Wallace; and Sandrud, Torsten, 3,673,657.

Sands, John L.: *See—*
Thomas, Robert M.; Gerns, Fred R.; and Sands, John L., 3,674,788.

Sangster, Arlon G.: *See—*
McNamara, Thomas J.; and Sangster, Arlon G., 3,675,100.

Sanraku Ocean Co., Ltd.: *See—*
Ikeda, Shigeho; Ishizaki, Ayaaki; Hirose, Yoshio; and Shiro, Teruo, 3,674,639.

Sansbury, John R.: *See—*
Jacobson, Stanley I.; and Sansbury, John R., 3,674,227.

Santos, Gerard R.; and Herring, James M., Jr., to Boothe Airside Systems, Inc., mesne. Hydraulic system for a vehicle. 3,674,107, Cl. 180-79.20r.

Sanyo Electric Co., Ltd.: *See—*
Iemura, Toshio; Doi, Masaru; and Shimizu, Yoshiaki, 3,674,944.

Sapers, Ira, to Arkansas Company, Inc. Cycloalkanone or alkyl aryl ketone assisting cationic dye and aromatic polyamide dyeing therewith. 3,674,420, Cl. 8-173.000.

Sarett, Lewis H.: *See—*
Ruyle, William V.; Sarett, Lewis H.; and Matzuk, Alexander R., 3,674,870.

Sargent & Company: *See—*
Filia, George J., 3,673,848.

Sarmiento, Louis, to International Stretch Products, Inc. Warp knit panty-type garment. 3,673,820, Cl. 66-177.000.

Sasaki, Katuyoshi: *See—*
Senoo, Saburo; Fukuoka, Yohei; and Sasaki, Katuyoshi, 3,674,851.

Sasaki, Shiro; and Shibata, Narajiro, to Toyo Rubber Industry Co., Ltd., The. Pneumatic tire with polyester casing, nylon breaker and stereo regular polybutadiene. 3,674,078, Cl. 152-330.000.

Sasse, Klaus: *See—*
Kampfer, Helmut; von Konig, Anita; Ranz, Erwin; von Rintelen, Harald; Mayer, Dietmar; and Sasse, Klaus, 3,674,479.
Kampfer, Helmut; Von Konig, Anita; Ranz, Erwin; von Ritelen, Harald; Mayer, Dietmar; and Sasse, Klaus, 3,674,480.

Satake, Toshihiko. System for preparing parboiled rough rice. 3,674,514, Cl. 99-237.00r.

Sato, Akira: *See—*
Shiba, Keisuke; Hinata, Masanao; Tsuji, Nobuo; and Sato, Akira, 3,674,499.

Sato, Kenji: *See—*
Ueda, Tadao; Sato, Kenji; and Nakamura, Yasusi, 3,674,426.

Sato, Masamichi. Electrodeposition. 3,674,543, Cl. 117-93.000.

Sato, Teruo: *See—*
Yoshiyama, Masami; Sato, Teruo; and Takeda, Hitoshi, 3,674,928.

Satz assor. to said Chernotsky: *See—*
Chernotsky, Alan; and Satz, Richard, 3,674,345.

Satz, Richard: *See—*
Chernotsky, Alan; and Satz, Richard, 3,674,345.

Sauer, Richard W.: *See—*
Statton, Gary L.; and Sauer, Richard W., 3,674,715.

Sauerbruch, Ernst; Scherrer, Donat; and Vogt, Willy, to Fahr Bucher GmbH Gottmadingen. Injection-molding machine with overhanging platen support. 3,674,400, Cl. 425-225.000.

Saunders, Barbara Joan. Hydraulically-operated trolley for hospital beds. 3,673,620, Cl. 5-63.000.

Saunders, Philip G., to Container Graphics Corporation. Creasing rules for cutting dies. 3,673,929, Cl. 93-58.20r.

Sawa, Kenneth B.: *See—*
Gomez, Ray J.; and Sawa, Kenneth B., 3,674,153.

Sawada, Hiraki, to Nissan Motor Company, Limited. Air-pollution preventing system. 3,673,997, Cl. 123-136.000.

Sayanagi, Kazuo, to Canon Kabushiki Kaisha. Stereoscopic photograph system using a stereoscopic attachment to a camera. 3,674,339, Cl. 350-130.000.

Sayles, Charles Philip: *See—*
Muller, Leslie Dyne; Sayles, Charles Philip; and Mozley, Richard Henry, 3,674,144.

Scalera, Frank T.: *See—*
Scarnecchia, Gregory; and Scalera, Frank T., 3,674,173.

Scaravilli, Joseph V., to Jarva, Inc. Gage scraper. 3,674,314, Cl. 299-86.000.

Scarnato, Thomas J.; Gordon, Paul C.; Hunter, Stephen R.; Krage, Paul W.; and Zablocki, Richard A., to International Harvester Company. Harvesting machine. 3,673,779, Cl. 56-503.000.

Scarnecchia, Gregory; and Scalera, Frank T., to Rowe International Inc. Column switching pivoted shelf merchanising machine. 3,674,173, Cl. 221-6.000.

Scazzola, Eugene. Vinificator. 3,673,947, Cl. 99-278.000.

Schaab, Carl K.; Weyrauch, George T.; and Davis, Terry R., to National Cash Register Company, The. Method of fabrication and reinforcing high solids-containing materials. 3,674,589, Cl. 156-245.000.

Schabbel, Roland, to Probat-Werke von Gimborn & Co. K.G. Coffee roasting plant with automatic sampling arrangement. 3,673,700, Cl. 34-89.000.

Schade, Kurt. Device for feeding palletes to a compression station of a roofing tile forming machine. 3,674,402, Cl. 425-306.000.

Schaffer, Detlef: *See—*
Knechtel, Wilhelm Josef; and Schaffer, Detlef, 3,675,010.

Schattner, Robert I. Method for regulating plant growth. 3,674,458, Cl. 71-77.000.

Schell, George W.: *See—*
Griesinger, William K.; Sorgenti, Harold A.; and Schell, George W., 3,674,885.

Schell, Raymond A.; and Kehoe, Lawrence J., to Ethyl Corporation. Preparation of olefins via PT-SN catalyst. 3,674,889, Cl. 260-681.000.

Scher, Herbert I.; and Ungar, Israel S., to Esso Research and Engineering Company. Embossing separator. 3,674,619, Cl. 161-119.000.

Scherb, Helmut: *See—*
Schleppinghoff, Bernhard; Scherb, Helmut; and Puxbaumer, Hans, 3,674,883.

Scherer, Otto; and Stahler, Gerhard, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. 2-0,0-Dithiophosphoryl methyl benzoxazole. 3,674,803, Cl. 260-307.00d.

Schering AG: *See—*
Philippson, Rainer; Hauser, Helmut; Gibian, Heinz; Kaspar, Emanuel; and Kessler, Hans-Joachim, 3,674,815.

Schering Corporation: *See—*
Sherlock, Margaret H.; and Sperber, Nathan, 3,674,832.

Scherrer, Donat: *See—*
Sauerbruch, Ernst; Scherrer, Donat; and Vogt, Willy, 3,674,400.

Schickler, John F.: *See—*
Ackerman, Tracy R.; and Schickler, John F., 3,674,087.

Schiff, Peter. Portable mechanical ventricular assistance device. 3,674,381, Cl. 417-234.000.

Schill, John M., to Keystone Consolidated Industries, Inc. Touch device for cabinet drawer or closure. 3,674,329, Cl. 312-319.000.

Schilling, Eugene D.; and Burchill, Phyllis I., to General Mills, Inc. Forming a filled edible casing. 3,674,506, Cl. 99-109.000.

Schinzel, Erich; Pintschovius, Ulrich; and Lebkucher, Karl Heinz, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Optical brighteners of the benzoxazole series. 3,674,781, Cl. 260-240.00d.

Schlage Lock Company: *See—*
Nelson, Kenneth R., 3,673,831.

Schlenker, Theodore R.: *See—*
Doran, Leo F.; and Schlenker, Theodore R., 3,673,817.

Schleppinghoff, Bernhard; Scherb, Helmut; and Puxbaumer, Hans, to Erdolchemie Gesellschaft mit beschrankter Haftung. Recovering cyclopentadiene values from C[05-fractions. 3,674,883, Cl. 260-666.00a.

Schlickeiser, Klaus, to Buhmann, Walter, Dipl. Ing., Elektro-Apparate-Bau GmbH. Text selection arrangement in automatic print-out devices. 3,675,207, Cl. 340-172.500.

Schlumberger Technology Corporation: *See—*
Cubberly, Walter E., Jr., 3,673,864.
Davis, Billy W., 3,675,193.
Kisling, James W., III, 3,674,091.
Urbanosky, Harold J., 3,674,090.

Schmalbach-Lubeca-Werke Aktiengesellschaft: *See—*
Fahlbush, Hans Joachim, 3,674,171.

Schmalfeld, Paul; Janssen, Heinrich; Bock, Burkhard; Peters, Werner; and Ahland, Erwin, to Metallgesellschaft Aktiengesellschaft and Bergwerks-Verban. Process of briquetting fine-grained cokes with caking coal in a plastic state. 3,674,449, Cl. 44-10.00r.

Schmid, Rolf: *See—*
Lohse, Friedrich; Schmid, Rolf; Fisch, Willy; and Batzer, Hans, 3,674,746.

Schmitz, Wolfgang: *See—*
Korner, Gerhard; Schmitz, Wolfgang; Dabringhausen, Friedhelm; and Gruber, Lothar, 3,674,957.

Schmutzler, David L.; and Schmutzler, John H., to Jadair, Incorporated. Method and apparatus for clarifying liquids. 3,674,145, Cl. 210-73.000.

Schmutzler, John H.: *See—*
Schmutzler, David L.; and Schmutzler, John H., 3,674,145.

Schnegg, Robert; Pelousek, Herbert; Dippolhofer, Robert; Wiegreffe, Wolfgang; Voelz, Hans-Georg; and Kienast, Gerhard, to Farbenfabriken Bayer Aktiengesellschaft. Process for the production of high molecular weight linear polyesters. 3,674,747, Cl. 260-75.00r.

Schneider, Alan A.; and Moser, James R., to Catalyst Research Corporation. Primary cells and iodine containing cathodes therefor. 3,674,562, Cl. 136-83.00r.

Schneider, Harold N.: *See—*
Titus, Charles H.; and Schneider, Harold N., 3,674,912.

Schneider-Simpson, Inc.: *See—*
Birtchet, Ralph D., 3,673,930.

Schoenbrunn, Erwin Frederick; and Sinha, Vinod Tarkeshwar, to American Cyanamid Company. Hydration of nitriles using metal salts of cation exchange resins. 3,674,848, Cl. 260-558.00r.

Scholl, Rolland D., to Caterpillar Tractor Company. Durable electrical switch. 3,675,169, Cl. 335-205.000.

Scholz, Gunther, to Gebruder Junghans G.m.b.H. Device for the magnetic arresting of a switch wheel of a timekeeping device. 3,673,792, Cl. 58-116.000.

Schommer, Alfred: *See—*
Oberst, Hermann; Ebigt, Joachim; Duve, Gunther; and Schommer, Alfred, 3,674,624.
Oberst, Hermann; Ebigt, Joachim; Duve, Gunther; and Schommer, Alfred, 3,674,625.

Schott, Dan J.: *See—*

Armstrong, James B.; Schott, Dan J.; and Warne, Leland C., 3,675,066.

Schou, Jorgen Martin Dohm, to Kefalas A/S. Crystalline fungimycin, a method of preparing same, compositions and use. 3,674,868, Cl. 424-122.000.

Schrotz, Kurt; and Becker, Werner. Labeling devices. 3,674,609, Cl. 156-577.000.

Schuierer, Manfred, to Bruckner-Apparatebau Michelstadt GmbH. Drum machine. 3,673,825, Cl. 68-20.000.

Schulz, Robert D., Jr. Integral tops and bowls for sinks and the like and methods of making the same. 3,673,617, Cl. 4-187.000.

Schulze, James L., Sr.: *See—*
Barnett, Richard C.; Dark, Joe W.; and Schulze, James L., Sr., 3,674,005.

Schur, Barbara Ellen. Board game apparatus. 3,674,274, Cl. 273-135.0ac.

Schwartz, Leonard; Purcell, Harold K.; and Wieselman, Jerome J., to RLR Chemical Company, Inc. Wrinkle removing product and process. 3,674,688, Cl. 252-8.800.

Schwarz, Milton H.; and Goldberg, Marvin E., to Revlon, Inc. Artificial hair. 3,674,631, Cl. 162-149.000.

Schwedhelm, Diether: *See—*
Dohmeier, Arnold; and Schwedhelm, Diether, 3,673,765.

Schweizer, Max Norman; and Moran, Arthur Stone. Self-lubricated shaft bearing for linear and rotary motion. 3,674,324, Cl. 308-6.00r.

Sciaky, Roberto: *See—*
Baldratti, Giuliana; Consonni, Alberto; and Sciaky, Roberto, 3,674,817.

Sciuto, Joseph, Jr.: *See—*
Hartman, Leonard; and Sciuto, Joseph, Jr., 3,674,052.

SCM Corporation: *See—*
Guzak, John, Jr., 3,673,957.
Hedman, Clarence L., Jr.; and Myrenne, Karl-Dieter S., 3,674,341.

Scott, John A.: *See—*
Rao, Velliyur Nott Padmanabha; Scott, John A.; and Surowiecki, Benjamin M., Jr., 3,674,827.

Scott, John W.: *See—*
Mitchell, David S.; Bridge, Alan G.; and Scott, John W., 3,674,682.

Scott Paper Company: *See—*
Kirk, Mahlon Randall, 3,674,726.

Scoville, Andrew E., to American Multi-Lert Corporation. Self-aligning motion detectors. 3,674,950, Cl. 200-61.480.

Scrine, Gerald Robin: *See—*
Hales, Kenneth Calvert; and Scrine, Gerald Robin, 3,673,810.

Seal Spout Europe S.p.A.: *See—*
Taddei, Carlo, 3,673,663.

Seaquist Valve Company; division of: *See—*
Evesque, Roger A., 3,674,185.

Seaquist Valve Company; divison of: *See—*
Ewald, Ronald F., 3,674,186.

Sechler, Robert F., to International Business Machines Corporation. Independent read-write monolithic memory array. 3,675,218, Cl. 340-173.0ff.

Secunda, Kenneth, to Federal-Mogul Corporation. Roller bearing assembly fixture. 3,673,661, Cl. 29-201.000.

Sedlarik, Jaroslav: *See—*
Havlas, Jiri; and Sedlarik, Jaroslav, 3,673,649.

Seeger, Horst K.: *See—*
Carter, Edward H., Jr.; Park, Vernon K.; and Seeger, Horst K., 3,674,765.

Seegmiller, Wan: *See—*
Young, Bruce O.; Walker, Grant W.; Ford, Duane B.; and Seegmiller, Wan, 3,674,115.

Sehnal, Jan: *See—*
Zaruba, Wenzel; and Sehnal, Jan, 3,673,874.

Seidel, Harold, to Bell Telephone Laboratories, Incorporated. Impedance-matching network. 3,675,164, Cl. 333-32.000.

Seko, Maomi; Ogawa, Shinsaku; Komori, Ryozo; Asuma, Masaro; Isoya, Toshiro; and Sakai, Takamasa, to Asahi Kasei Kogyo Kabushiki Kaisha. Method of the purification of catholytes. 3,674,653, Cl. 203-34.000.

Sekse, Torkjell: *See—*
Francini, Joseph Pirra; Braxton, James Lopez, Jr.; Lewis, Vera Gloria; McPherson, Frank Henderson; Rosenberg, Daniel; and Sekse, Torkjell, 3,674,988.

Self, James M., to Du Pont de Nemours, E. I., and Company. Moldable metal powder compositions. 3,674,526, Cl. 106-286.000.

Sellers, John. Loom and woven tape made therefrom. 3,674,058, Cl. 139-124.00a.

Sellet, Lucien, to Diamond Shamrock Corporation. Process of treating leather with alkoxylated Mannich compositions, and optionally tanning agents, and products thereof. 3,674,415, Cl. 8-94.210.

Selley, Wilbur-Webb, to Vactronics Incorporated. Simplified mounting arrangement. 3,674,287, Cl. 285-7.000.

Sells, Bertram C. Board game apparatus. 3,674,273, Cl. 273-134.0aa.

Sendor, Mortimer S., to Bookwrights, Inc. Apparatus for making plastic book covers. 3,674,399, Cl. 18-4.00c.

Sennewald, Kurt: *See—*
Vogt, Wilhelm; Sennewald, Kurt; and Glaser, Hermann, 3,674,839.

Senoo, Saburo; Fukuoka, Yohei; and Sasaki, Katuyoshi, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for the preparation of aliphatic tertiary amides. 3,674,851, Cl. 260-561.00r.

Serata, Shosei. Method of controlling long term safety of underground entry system by regulating formation of stress envelopes. 3,673,807, Cl. 61-35.000.

Serkov, Anatoly Gavrilovich: *See—*
Berlin, Zalman Leivikovich; Bagrov, Oleg Nikolaevich; Maslovsky, Gennady Vasilievich; Serkov, Anatoly Gavrilovich; and Yakimovich, Viktor Yakovlevich, 3,673,988.

Serpas, Luis B.: *See—*
Ellers, Frederick S.; Small, Sam W.; and Serpas, Luis B., 3,674,062.

Serrano, Leonardo V., to Rosemount Inc. Measurement apparatus having non-contact electrical coupling to components on a moving surface. 3,674,963, Cl. 219-10.610.

Sevenska Dalaregister AB: *See—*
Skoog, Hilding G. A., 3,675,109.

Seybold, James M.: *See—*
Fischer, Robert E.; Raiff, Lawrence C.; Seybold, James M.; and Zimmerle, Donald F., 3,674,924.

Shaffer, John W., to Sylvania Electric Products, Inc. Photoflash lamp. 3,674,411, Cl. 431-93.000.

Shaham, Ilan: *See—*
Waterman, Jacques Abraham; Shaham, Ilan; and Shorr, Leonard M., 3,674,756.

Shaheen, John. Remote vehicle starting system. 3,675,032, Cl. 290-38.00c.

Shandon-Elliott Limited: *See—*
Howells, Francis Thomas; and Ashe, Anthony Grenfell, 3,674,040.

Shank, Charles P.: *See—*
Bayless, Robert G.; Shank, Charles P.; Botham Ruth A.; and Werkmeister, Dennis W., 3,674,704.

Shanni, Vincent: *See—*
Boassy, Emil J.; and Shanni, Vincent, 3,673,751.

Sharp, Alister Kimball: *See—*
Lilly, Malcolm Douglas; Kay, Garth, and; Wilson, Richard John Hugh; and Sharp, Alister Kimball, 3,674,767.

Shatterproof Glass Corporation: *See—*
Jendrisak, Joseph E.; and McKelvey, Harold E., 3,673,900.

Shaw, Arthur R.: *See—*
Bennett, Ronald W.; Parker, Donald L.; and Shaw, Arthur R., 3,675,197.

Sheets, Harry L.; and Booth, Robert W. Football blocking and tackling sled. 3,674,265, Cl. 273-55.00r.

Sheffield, Jackson George: *See—*
Sturgeon, George Mc Hardy; and Sheffield, Jackson George, 3,674,390.

Shell Oil Company: *See—*
Haycock, Ernest W., 3,674,662.
Stewart, Richard C.; and Creamer, Edward L., 3,674,469.

Shellenberger, Donald J., to Jones & Laughlin Steel Corporation. Closed end tuyere coil. 3,674,248, Cl. 266-41.000.

Shellman, Kenneth S., Sr. Table tennis paddle construction with improved handle means therefor. 3,674,268, Cl. 273-76.000.

Shen, James T. Ouchterlony technique apparatus. 3,674,438, Cl. 23-253.00r.

Shen, Tsung-Ying; Witzel, Bruce E.; and Walford, Gordon L., to Merck & Co., Inc. Substituted phenylsulfamyl salicylic acids and derivatives thereof. 3,674,843, Cl. 260-519.000.

Shen, Tsung-Ying; Jones, Howard; Witzel, Bruce E.; and Walford, Gordon L., to Merck & Co., Inc. Salicylic acid derivatives. 3,674,844, Cl. 260-519.000.

Shen, Tsung-Ying; Ruyle, William V.; Witzel, Bruce E.; and Walford, Gordon L., to Merck & Co., Inc. Treatment of inflammation. 3,674,875, Cl. 424-285.000.

Shephard, Robert Basil; Clachan, Margaret Loudon; Kennedy, David Rankine; and Abbott, Terence Arnold, to Bexford Limited. Synthetic polyester film assemblies. 3,674,531, Cl. 117-7.000.

Shepherd, Thomas H.; and Gould, Francis E., to National Patent Development Corporation. Surgical sutures. 3,674,901, Cl. 424-27.000.

Sherlock, Margaret H.; and Sperber, Nathan, to Schering Corporation. Cyclopropane carboxylic acid derivatives. 3,674,832, Cl. 260-469.000.

Sherritt Gordon Mines Limited: *See—*
Evans, David J. I.; and Weir, Donald Robert, 3,674,465.

Sherwood Medical Industries Inc.: *See—*
Burlis, Norbert W.; and Talonn, Daniel A., 3,674,404.

Shiba, Keisuke; Hinata, Masanao; Tsuji, Nobuo; and Sato, Akira, to Fuji Photo Film, Ltd. Silver halide photographic supersensitized emulsion. 3,674,499, Cl. 96-123.000.

Shibata, Narajiro: *See—*
Sasaki, Shiro; and Shibata, Narajiro, 3,674,078.

Shichijo, Yoshihisa; and Tsujihara, Mamoru, to Asahi Kasei Kogyo Kabushiki Kaisha. Treatment of cellulosic fabrics. 3,674,416, Cl. 8-116.300.

Shideler, Paul J.: *See—*
Koehler, Albert T.; Shideler, Paul J.; and Dohogne, Linus E., 3,673,950.

Shields, Dean W., to Owens-Illinois, Inc. Tree shear. 3,674,066, Cl. 144-34.00e.

Shikoku Kasei Koygo Company Limited: *See—*

Matsubara, Mitio; Yagyu, Shigeyuki; and Takeuchi, Satoru, 3,674,533.
Shima, Hiroshi: *See—*
Kurauchi, Noritaka; Tada, Shotaro; Shima, Hiroshi; Hiraoka, Susumu; Nagao, Taichiro; Koyama, Masahiro; Shiraishi, Satoshi; Shindo, Masuo; and Kobayashi, Yoshinobu, 3,674,990.
Shimadzu Seisakusho Ltd.: *See—*
Tsuda, Motohisa; and Yoshimura, Masao, 3,675,027.
Shimamura, Isao: *See—*
Iijima, Yoo; Shimamura, Isao; Kondo, Tokiharu; and Haruhike, Iwano, 3,674,491.
Shimizu, Yoshiaki: *See—*
Iemura, Toshio; Doi, Masaru; and Shimizu, Yoshiaki, 3,674,944.
Shindo, Masuo: *See—*
Kurauchi, Noritaka; Tada, Shotaro; Shima, Hiroshi; Hiraoka, Susumu; Nagao, Taichiro; Koyama, Masahiro; Shiraishi, Satoshi; Shindo, Masuo; and Kobayashi, Yoshinobu, 3,674,990.
Shinkawa, Yuichi. Process for manufacturing instant hamburger steak. 3,674,505, Cl. 99-108.000.
Shintani, Sotokichi: *See—*
Yanagidaira, Hidetaka; Kawai, Kazuo; and Shintani, Sotokichi, 3,674,996.
Shionogi & Co., Ltd.: *See—*
Hayakawa, Shohei; Kanematsu, Yoshiko; and Fujiwara, Takashi, 3,674,842.
Shipowners Refrigerated Cargo Research Association: *See—*
Hales, Kenneth Calvert; and Scrine, Gerald Robin, 3,673,810.
Shiraishi, Satoshi: *See—*
Kurauchi, Noritaka; Tada, Shotaro; Shima, Hiroshi; Hiraoka, Susumu; Nagao, Taichiro; Koyama, Masahiro; Shiraishi, Satoshi; Shindo, Masuo; and Kobayashi, Yoshinobu, 3,674,990.
Shiro, Teruo: *See—*
Ikeda, Shigeho; Ishizaki, Ayaaki; Hirose, Yoshio; and Shiro, Teruo, 3,674,639.
Shlyapnikov, Alexel Dmitrievich: *See—*
Zykov, Vladimir Pavlovich; Panov, Alexei Alexandrovich; Prudnikov, Pavel Alexeevich; Khlopin, Mikhail Ivanovich; and Shlyapnikov, Alexel Dmitrievich, 3,675,087.
Shoap, Stephen Davis, to Bell Telephone Laboratories, Incorporated. Serial gray-to-binary translator with clock transition timing. 3,675,236, Cl. 340-347.0dd.
Shorr, Leonard M.: *See—*
Waterman, Jacques Abraham; Shaham, Ilan; and Shorr, Leonard M., 3,674,756.
Shortway, Harry A.: *See—*
Petry, Robert K.; and Shortway, Harry A., 3,674,611.
Showa Zoki Co., Ltd.: *See—*
Watanabe, Shigeru; and Ito, Michinobu, 3,673,745.
Shunichiro, Nishizaki; and Akira, Fukami, to Mitsubishi Electric Corporation. Copolymer of poly(quinozolone and imide) and process for producing the same. 3,674,741, Cl. 260-47.0cp.
Shur-Lok Corporation: *See—*
Hoegee, Robert A., 3,674,075.
Shuto, Yoshitaka. Sectional golf bag. 3,674,072, Cl. 150-1.50r.
Siai-Marchetti S.p.A.: *See—*
Monti, Giancarlo, 3,674,379.
Sicard, Marcel Clarence, to AMF Incorporated. Filtration apparatus. 3,674,154, Cl. 210-456.000.
Siddall, John B., to Zoecon Corporation. Photochemical process for preparing a bicyclic lactone. 3,674,663, Cl. 204-158.00r.
Sidorov, Oleg Pavlovich; Ryabtsev, Pavel Sergeevich; Lastochkin, Rostislav Ivanovich, deceased; Lastochkina, Nadezhda Andreevna; and Lastochkina, Tatyana Rostislavovna; administrators. Dynamoelectric machine. 3,675,102, Cl. 310-266.000.
Sieber, Charles: *See—*
Gruenig, Rudolf; Berger, Erwin; and Sieber, Charles, 3,674,200.
Siedband, Melvin P.; Duffy, Philip A., Jr.; and James, Jack L., to CGR Medical Corporation, mesne. X-ray tube control circuitry. 3,675,020, Cl. 250-93.000.
Siegel, Edgar, to Farbenfabriken Bayer Aktiengesellschaft. Phenyl-azophenol dyestuffs. 3,674,771, Cl. 260-206.000.
Siemens Aktiengesellschaft: *See—*
Fahrbach, Kurt Erich, 3,675,192.
Hermstein, Wolfgang; and Mollenbeck, Klaus, 3,675,123.
Heywang, Walter; and Sirtl, Erhard, 3,674,552.
Paul, Bernt, 3,675,018.
Richter, Gerhard; Kroes, Magdalena; and Frietzsche, Angelika, 3,674,710.
Rimkus, Hans, 3,674,586.
Stadler, Georg; and Vogg, Erwin, 3,674,694.
Voelkl, Walter, 3,675,094.
Signetics Corporation: *See—*
Kocsis, Joseph; and Cauge, Thomas Peter, 3,675,092.
Silken, Howard. Doweling jig. 3,674,376, Cl. 408-115.000.
Silver, Robert Steven: *See—*
Luedicke, Eduard; and Silver, Robert Steven, 3,675,134.
Silverberg, Morton, to Xerox Corporation. Enclosed migration imaging system. 3,674,475, Cl. 96-1.300.
Silverberg, Morton, to Xerox Corporation. Methods and apparatus for operating paired corotrons of opposite polarity. 3,675,011, Cl. 250-49.5zc.
Simakura, Masao: *See—*
Murashige, Hidekichi; Simakura, Masao; and Nakazawa, Kazuo, 3,673,754.
Simco; a co-partnership consisting of: *See—*
Bauer, Eddie, 3,673,727.
Simms, James B. Cam operated fetachable carton handle. 3,674,300, Cl. 294-31.200.
Simon, Jean Ellen, to Colgate-Palmolive Company. Flexible film bag with tear strip for closure. 3,674,135, Cl. 206-58.000.
Singh, Shanker, to International Business Machines Corporation. Fast adder for multi-number additions. 3,675,001, Cl. 235-175.000.
Sinha, Vinod Tarkeshwar: *See—*
Schoenbrunn, Erwin Frederick; and Sinha, Vinod Tarkeshwar, 3,674,848.
Sirtl, Erhard: *See—*
Heywang, Walter; and Sirtl, Erhard, 3,674,552.
Sjostrom, Gosta; deceased (by Sjostrom, Ruth; and Sjostrom, Kjell; heirs). System for arresting the movement of objects travelling along a defined path. 3,674,117, Cl. 187-67.000.
Sjostrom, Kjell: *See—*
Sjostrom, Gosta, 3,674,117.
Sjostrom, Ruth: *See—*
Sjostrom, Gosta, 3,674,117.
SKF Kugellagerfabriken GmbH: *See—*
Breitenbach, Karl-Heinz, 3,673,781.
Skinner, John George: *See—*
Goldrick, Michael Richard; Kerwin, Robert Eugene; and Skinner, John George, 3,674,492.
Skoog, Hilding G. A., to Sevenska Dalaregister AB. Information transmitting device. 3,675,109, Cl. 321-2.000.
Slama, Karel: *See—*
Romanuk, Miroslav; Slama, Karel; and Sorm, Frantisek, 3,674,819.
Small, Sam W.: *See—*
Ellers, Frederick S.; Small, Sam W.; and Serpas, Luis B., 3,674,062.
Smarook, Walter H.: *See—*
Purcell, Chester L.; and Smarook, Walter H., 3,674,896.
Smiley, Yale H., to Uniroyal Ltd. Fabric packaging. 3,674,222, Cl. 242-77.100.
Smith & Wesson Chemical Company, Inc.: *See—*
Crewe, John Mervyn, 3,674,174.
Smith, A. O., Corporation: *See—*
Petrigalla, Andrew, 3,675,105.
Smith, Barton K.: *See—*
Bell, Jack T.; and Smith, Barton K., 3,673,764.
Smith, Hampton D., Jr.: *See—*
Obenland, Clayton O.; Papetti, Stelvio; and Smith, Hampton D., Jr., 3,674,853.
Smith, James I. Rotary blade apparatus. 3,673,776, Cl. 56-16.900.
Smith, James P., to Ostby & Barton Co. Electrical connector. 3,675,189, Cl. 339-221.00r.
Smith Kline & French Laboratories: *See—*
Kaiser, Carl; and Zirkle, Charles L., 3,674,792.
Smith, Peter B., to Dynamics Corporation of America. Standby power system. 3,675,112, Cl. 322-4.000.
Smith, R. M., Inc.: *See—*
Gilmour, Robert A., 3,674,138.
Smith, Robert M., to Hy-Dynamic Co., The, mesne. Rough terrain vehicle. 3,674,162, Cl. 214-138.00r.
Smith, Roger K., to International Fineblanking Corporation. Quick-change tooling for fineblanking presses. 3,673,908, Cl. 83-685.000.
SMW Atlanta, Inc., mesne: *See—*
Wells, Robert A.; and Strobe, Carl J., 3,674,172.
Snaper, Alvin A.; Gregory, George D.; and Munroe, Miles R., to Advaced Patent Technology, Inc. Planar random access ferroelectric computer memory. 3,675,220, Cl. 34-173.200.
Snitzer, Elias: *See—*
Landry, Robert J.; and Snitzer, Elias, 3,675,155.
Snyder, George P.: *See—*
Nugent, Reginald F.; and Snyder, George P., 3,674,975.
Snyder, Harold I.; and Trexler, Richard R. Plastic bandage or splint. 3,674,021, Cl. 128-90.000.
Snyder, John Sommerville, to Sybron Corporation. Systems involving division. 3,675,003, Cl. 235-196.000.
Societa Farmaceutici Italia: *See—*
Baldratti, Giuliana; Consonni, Alberto; and Sciaky, Roberto, 3,674,817.
Societa Italiana Resine S.p.A.: *See—*
Pitzalis, Mario; Vargiu, Silvio; and Nistri, Ugo, 3,674,732.
Reni, Cesare; Gualdi, Giorgio; and Lugo, Luigi, 3,674,845.
Societe Anonyme Automobiles Citroen: *See—*
Grosseau, Albert, 3,674,544.
Societe Anonyme D.B.A.: *See—*
Mangold, James, 3,674,317.
Societe anonyme dite: Compagnie Gervais-Danone: *See—*
Carasso, Daniel, 3,674,507.
Societe Anonyme dite: L'Oreal: *See—*
Bore, Pierre, 3,674,038.
Kalopissis, Gregoire; and Vanlerberghe, Guy, 3,674,902.
Societe Anonyme dite: Roussel-UCLAF: *See—*
Boissier, Jacques Robert; and Ratouis, Roger, 3,674,841.
Societe Industrielle Honeywell Bull Societe Anonyme: *See—*
Jammaud, Andre, 3,675,084.
Societe Lannionaise d'Electronique: *See—*
Jacob, Jean-Baptiste, 3,674,938.
Societe Nouvelle Spidem: *See—*
Diolot, Lucien, 3,673,843.

Societe Parisienne des Anciens Etablissements Barbier, Benard & Turenne: *See*—
Benard, Christian Louis Georges, 3,675,024.

Solcova, Jitka: *See*—
Kralicek, Jaroslav; Kubanek, Vladimir; Solcova, Jitka; and Kondelikova, Jaroslava, 3,674,751.

Sole, Lloyd H.: *See*—
Casey, Ernest D.; and Sole, Lloyd H., 3,673,629.

Soli, Giorgio, to United States of America, Navy. Bacterial lamp. 3,674,648, Cl. 195-127.000.

Solitron Devices, Inc.: *See*—
Edwards, Lon E., 3,675,148.

Somich, Robert T., to Monsanto Company. Boron phosphate catalyst. 3,674,708, Cl. 252-432.000.

Sorgenti, Harold A.: *See*—
Griesinger, William K.; Sorgenti, Harold A.; and Schell, George W., 3,674,885.

Sorm, Frantisek: *See*—
Romanuk, Miroslav; Slama, Karel; and Sorm, Frantisek, 3,674,819.

Sorvall, Ivan, Inc.: *See*—
Mitchell, David F.; and Romanauskas, William A., 3,674,197.

Soukup, Dale F.: *See*—
Heyer, William T.; and Soukup, Dale F., 3,674,237.

Southco, Inc.: *See*—
Barry, John K., 3,673,913.

Southiere, Bertrand, to Bombardier Limited. Chain tensioning device for snowmobile type transmission. 3,673,884, Cl. 74-242.11s.

Spacek, George Ctirad. Fuel consumption indicator. 3,673,863, Cl. 73-114.000.

Spangler, Richard M., to Hewlett-Packard Company. Stored data recall means for an electronic calculator. 3,675,213, Cl. 340-172.500.

Spann, Donald C., to Phillips Petroleum Company. Imitation sliver knit pile fabric. 3,674,618, Cl. 161-64.000.

Sperber, Nathan: *See*—
Sherlock, Margaret H.; and Sperber, Nathan, 3,674,832.

Sperry Rand Corporation: *See*—
Armstrong, James B.; Schott, Dan J.; and Warne, Leland C., 3,675,066.
Ashley, James R.; and Palka, Frank M., 3,675,124.
Caulfield, Henry John, 3,674,331.
Edstrom, Woodrow O.; and Norling, Charles H., 3,673,669.
Francini, Joseph Pirra; Braxton, James Lopez, Jr.; Lewis, Vera Gloria; McPherson, Frank Henderson; Rosenberg, Daniel; and Sekse, Torkjell, 3,674,988.
Jeffery, Robert W.; Brown, Robert A., Jr.; and Cullen, Allen F., 3,673,978.
Lincoln, Andrew J.; and Menger, Karl S., 3,675,000.
Metz, Louis C., 3,675,234.
Warne, Leland C., 3,675,065.

Spiegelberg, Hans: *See*—
Edenhofer, Albrecht; and Spiegelberg, Hans, 3,674,799.

Spieth, Howard H.: *See*—
Randle, Walter N.; Spieth, Howard H.; and English, William D., 3,673,871.

Spindt, Charles A.; and Rogers, Kendal T., to Stanford Research Institute. High current continuous dynode electron multiplier. 3,675,063, Cl. 313-104.000.

Spinski, Victor, to University of Delaware. Photographs on ceramic or ceramic-like srfaces. 3,674,484, Cl. 96-34.000.

Sponcel Limited: *See*—
Jones, David Thomas; Jowett, George Edward; and Webster, Edward Ernest, 3,674,030.

Spry, Douglas O., to Lilly, Eli, and Company. Cephalosporins via penicillin sulfoxide conversion. 3,674,775, Cl. 260-239.100.

Square D Company: *See*—
Kroeger, Jerry E., 3,674,962.
Stanback, Harris I., 3,675,085.

Squibb, E. R., & Sons, Inc.: *See*—
Aszalos, Adorjan; Robison, Robert S.; Kraemer, Nancy; Henshaw, Jo Ann; and Giannini, Mary Suzanne, 3,674,867.

Stache, Ulrich; Radscheit, Kurt; Fritsch, Werner; Haede, Werner; and Lindner, Ernst, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. 4-Chloro-3-oxo-14-hydroxy- or 4-chloro-3,14-dihydroxy-carda-4,20(22)-dienolides and process for their manufacture. 3,674,779, Cl. 260-239.570.

Stadler, Georg; and Vogg, Erwin, to Siemens Aktiengesellschaft. Manganese zinc-ferrite core. 3,674,694, Cl. 252-62.590.

Stahler, Gerhard: *See*—
Scherer, Otto; and Stahler, Gerhard, 3,674,803.

Stahnke, Edward J., to Interlake, Inc. Welded joint strapping machine. 3,674,972, Cl. 19-56.000.

Staiger, Ulrich, to Eastman Kodak Company. Viewer. 3,674,350, Cl. 353-27.000.

Staker, William C., to General Motors Corporation. Potential controlled oscillator. 3,675,160, Cl. 331-113.00r.

Stamicarbon N.V.: *See*—
Kaasenbrood, Petrus J. C.; and van Nassau, Petrus J. M., 3,674,847.
van Asperen, Pieter J.; and van der Loos, Jozef L. M., 3,674,658.

Stampfli, Harald, to Lucifer S.A. Electromagnetic system controlling a movable member through the agency of a magnetic field. 3,675,040, Cl. 307-133.000.

Stanback, Harris I., to Square D Company. Panel board for stacked electrical devices with sealing covers. 3,675,085, Cl. 317-106.000.

Standard Oil Company: *See*—
Hoekstra, Gerald B.; and Jacobs, Robert B., 3,674,680.
Karli, Robert E.; and Lee, Richard J., 3,674,691.

Standing, Arthur F., to Communications Satellite Corporation. Reduction of intermodulation products. 3,675,138, Cl. 328-163.000.

Stanford Research Institute: *See*—
Spindt, Charles A.; and Rogers, Kendal T., 3,675,063.

Stanley, Robert W.; Ames, Horace L.; and Jennings, Peter H., to Brenda Mines, Ltd. Process for purifying molybdenite concentrates. 3,674,424, Cl. 23-15.00w.

Stanway, Edward. Apparatus for the fluid treatment of fabrics in rope form. 3,673,826, Cl. 68-176.000.

Starnes, William H., Jr., to Esso Research and Engineering Company. 3,5 Dialkyl-4-hydroxy benzyl- trialkyl phosphonium chlorides and corresponding zwitterions. 3,674,854, Cl. 260-606.50f.

Startin, Kenneth John; and Ahmed, Kamal, to AMP Incorporated, mesne. Multiple cold crimp sleeve plug and socket. 3,675,188, Cl. 339-220.00r.

Statton, Gary L.; and Sauer, Richard W., to Atlantic Richfield Company. Solid soluble polymers from 4-vinylcyclohexene diepoxide. 3,674,715, Cl. 260-2.0ep.

Stauffer Chemical Company: *See*—
Giolito, Silvio Louis, 3,674,697.
Weil, Edward D., 3,674,698.

Stawarski, Chester C.; Gerding, Charles C.; and Adams, Richard T. Releasable supporting apparatus. 3,673,869, Cl. 73-343.00r.

Stefani, Hugo, Jr. Apparatus for passively exercising a person's abdominal muscles. 3,674,017, Cl. 128-25.00r.

Stefaniak, Hans: *See*—
Finsterwalder, Ulrich; Finsterwalder, Klemens; and Stefaniak, Hans, 3,673,624.

Steinemann, Willy: *See*—
Entschel, Roland; and Steinemann, Willy, 3,674,772.

Stemniski, John R., to Monsanto Research Corporation. Monomeric and polymeric bis (aryl-oxyaryl) tin compounds. 3,674,822, Cl. 260-429.700.

Stepaniuk, Nickolas J.: *See*—
Betz, Norman L.; and Stepaniuk, Nickolas J., 3,674,501.

Stephenson, Robert L., to Allied Chemical Corporation. Method and apparatus for filling vehicle gas bags. 3,674,059, Cl. 141-4.000.

Steranko, James J., to Inforex, Inc. Electrical circuit board wiring. 3,673,681, Cl. 29-626.000.

Sterling Drug Inc.: *See*—
Bailey, Denis M., 3,674,793.

Stern, Theodore J., to A.I.T. Industries, Inc. Edge control device for grinding machine. 3,673,738, Cl. 51-93.000.

Steury, Virgil H. Camper type vehicle and drive assembly for raising the top thereof. 3,674,305, Cl. 296-27.000.

Stever, William Charles: *See*—
Strater, Kurt; Hall, William Bernard; Mihalick, Eugene Michael; and Stever, William Charles, 3,673,983.

Stewart, Clarence K. Preparation of asphalt paving material. 3,674,242, Cl. 259-158.000.

Stewart, John K., Jr.: *See*—
Clinehens, Richard M.; Stewart, John K., Jr.; and Ditmer, Robert W., 3,674,579.

Stewart, Richard C.; and Creamer, Edward L., to Shell Oil Company. Welding electrode. 3,674,469, Cl. 75-124.000.

Stewart, William F., to Perkins Engines Limited. Crankshaft balance weights and method of assembly. 3,673,651, Cl. 29-6.000.

Stier, Otto; Kuhn, Heinz; and Vollmer, Udo, to Vollmer Werke Maschinenfabrik GmbH. Apparatus for providing a cutting tool with a cutting portion of a metal harder than a base metal of the cutting tool which carries the cutting portion. 3,674,083, Cl. 164-251.000.

Stile-Craft Manufacturers, Inc.: *See*—
Hartman, Leonard; and Sciuto, Joseph, Jr., 3,674,052.

Stoklasek, Antonin. Pneumatic stabilizing system for vehicles. 3,674,282, Cl. 280-124.00f.

Stol, George H.: *See*—
Peisner, Israel D.; Stol, George H.; and Gotcher, Eugene D., 3,673,969.

Stone, Eliot: *See*—
Patel, Pravin K.; and Stone, Eliot, 3,674,554.

Stone, J. James, Jr.; Madden, Thomas J., Jr.; Gerlach, Glendon T.; and Keur, Robert I., to Dick, A. B., Company. Image copying apparatus. 3,673,936, Cl. 95-12.000.

Stone, Ralph K., to United States Envelope Company. Filled and sealed easily opened bag and method of making same. 3,674,195, Cl. 229-66.000.

Stone, Roland L.: *See*—
Hahn, Richard L.; Stone, Roland L.; Tarrant, James R.; and Hunt, Lee D., 3,675,072.

Strack, Richard R., to American Optical Corporation. Method of fabricating illuminated fiber optics. 3,674,452, Cl. 65-4.000.

Strater, Kurt; Hall, William Bernard; Mihalick, Eugene Michael; and Stever, William Charles, to RCA Corporation. High capacity deposition reactor. 3,673,983, Cl. 118-48.000.

Stratman, Paul E., to Safe Way Hydraulics, Inc. Hydraulic coupler. 3,674,051, Cl. 137-614.040.

Strauss, Erwin S. Floating platform. 3,673,975, Cl. 114-43.500.

Strauss, Herbert S., to Duro-Test Corporation. Seal structures for electric discharge lamps. 3,675,068, Cl. 313-217.000.

Strecker, Otto C., K.G.; and: *See*—

Moesser, Wilhelm, 3,674,194.
Street, Frederick G.; and Buckwalter, Paul S. Disc puzzle. 3,674,276, Cl. 273-157.00r.
Streicher, Heinz; Riek, Siegfried; and Leutwein, Manfred, to Eastman Kodak Company. Reader for information carriers in sheet form. 3,674,351, Cl. 353-27.000.
Striplin, Charles D., to Weyerhaeuser Company. Machine for forming and sealing bliss style containers. 3,673,928, Cl. 93-36.300.
Strobe, Carl J.: *See*—
Wells, Robert A.; and Strobe, Carl J., 3,674,172.
Strobel, Walter. Die set; fixture and method of making dies. 3,673,902, Cl. 83-133.000.
Strolle, Clifford Hugh, to Du Pont de Nemours, E. I., and Company. Radiation curable epoxy coating composition and method of coating. 3,674,545, Cl. 117-93.310.
Stromberg Datagraphix, Inc.: *See*—
Artaud, Maurice H.; Johnson, Ronald W.; and Sampath, Prativadi I., 3,674,354.
Boyd, Sherman H., Jr., 3,674,591.
Hamann, Omer F., 3,673,933.
Rottmiller, Edmund H., 3,673,932.
Stromberg, Sanford E., to Textron Inc. Electrodeposition method and product. 3,674,671, Cl. 204-181.
Strong, John D. Achromatic doublet lens for infrared radiation. 3,674,330, Cl. 350-2.000.
Strout, Frederick D., to General Electric Company. Video generator for data display. 3,675,232, Cl. 340-324.00a.
Strub, Dietrich: *See*—
Kuffer, Francois; and Strub, Dietrich, 3,674,050.
Structural Fibers, Inc.: *See*—
Wiltshire, Arthur J., 3,673,673.
Wiltshire, Arthur J., 3,674,394.
Wiltshire, Arthur J., 3,674,599.
Struve, William Scott: *See*—
Aldridge, Gerald Richard; Ehrich, Felix Frederick; and Struve, William Scott, 3,674,814.
Stumpf, Gunter. Follower appliance for fabric folding machines. 3,674,253, Cl. 270-31.000.
Sturgeon, George; and Jackson, George, to British Iron and Steel Research Association, The. Apparatus for production of metal strip from metal powder. 3,674,389, Cl. 425-79.000.
Sturgeon, George Mc Hardy; and Sheffield, Jackson George, to British Iron and Steel Research Association, The. Production of metal strip from metal powder. 3,674,390, Cl. 425-79.000.
Sturges, James R.: *See*—
McMurray, Mitchell; Plouzek, Eugene A.; and Sturges, James R., 3,674,279.
Subbuteo Sports Games Limited: *See*—
Samson, Julie Marie, 3,674,275.
Sugaya, Hiroshi; and Nasu, Takuya, to Matsushita Electric Industrial Co., Ltd. Magnetic recording and reproducing apparatus of cassette type. 3,674,942, Cl. 179-100.22.
Sugihara, Kanji: *See*—
Hozumi, Shiro; Hirai, Kenichi; Tanigawa, Yoshiyuki; Yoshida, Katuro; and Sugihara, Kanji, 3,673,666.
Sugihara, Kunihiko: *See*—
Nakajima, Yasuo; Hayashi, Yoshimasa; and Sugihara, Kunihiko, 3,673,993.
Sukornick, Bernard: *See*—
Price, Alson K.; and Sukornick, Bernard, 3,674,798.
Sumitomo Chemical Company, Limited: *See*—
Ichiki, Eiichi; Iida, Kazuo; Inoue, Yasuhiko; and Kondo, Yoshihiro, 3,674,541.
Yamamoto, Keisaku; Takao, Hiroyoshi; Hirooka, Masaaki; and Oshima, Teruo, 3,674,755.
Sumitomo Chemical Company, Ltd.: *See*—
Inaba, Shigeho; Akatsu, Mitsuhiro; and Yamamoto, Hisao, 3,674,808.
Sumitomo Electric Industries, Ltd.: *See*—
Kurauchi, Noritaka; Tada, Shotaro; Shima, Hiroshi; Hiraoka, Susumu; Nagao, Taichiro; Koyama, Masahiro; Shiraishi, Satoshi; Shindo, Masuo; and Kobayashi, Yoshinobu, 3,674,990.
Summer, James R., to Garrett Corporation, The. Fail-safe inflatable slide. 3,674,124, Cl. 193-25.00b.
Sun Oil Company: *See*—
Rennick, Leonard E., 3,674,831.
Surface Technology Corporation: *See*—
Van Thyne, Ray J.; and Rausch, John J., 3,674,571.
Van Thyne, Ray J.; and Rausch, John J., 3,674,572.
Van Thyne, Ray J.; and Rausch, John J., 3,674,573.
Van Thyne, Ray J.; and Rausch, John J., 3,674,574.
Surowiecki, Benjamin M., Jr.: *See*—
Rao, Vellivur Nott Padmanabha; Scott, John A.; and Surowiecki, Benjamin M., Jr., 3,674,827.
Sussenguth, Edward H.: *See*—
Arnold, Richard F.; Dauber, Philip S.; and Sussenguth, Edward H., 3,675,215.
Suttle, Ward C.: *See*—
Hickner, George B.; Howard, Donald W.; and Suttle, Ward C., 3,674,318.
Suzuki, Akira: *See*—
Tomita, Tamaki; and Suzuki, Akira, 3,673,886.
Suzuki, Choken: *See*—
Tsuzuki, Akira; and Suzuki, Choken, 3,673,789.
Suzuki, Koichiro: *See*—
Kobayashi, Seihin; Torii, Michihiro; and Suzuki, Koichiro, 3,675,223.
Suzuki, Nobuhiko, to Nippon Gakki Seizo Kabushiki Kaisha. Presetting device for electronic musical instrument. 3,675,173, Cl. 335-268.000.
Suzuki, Reiichi; Tahara, Tadasu; and Mototani, Hideo, to Nitto Kasei Co., Ltd. Crystalline propylene polymer compositions of improved workability. 3,674,769, Cl. 260-93.700.
Suzuki, Takashi, to Matsushita Electric Industrial Co. Ltd. Heat-sensitive sheet. 3,674,538, Cl. 117-36.700.
Suzuki, Tetsumi: *See*—
Yamawaki, Takeshi; Usami, Masakatsu; Suzuki, Tetsumi; and Uematsu, Takao, 3,674,759.
Suzuki, Yoshiro; Nagahara, Shigehiro; and Ichimura, Nobuyoshi, to Asahi Glass Company Limited. Solder glass for adhering, sealing or coating. 3,674,520, Cl. 106-54.000.
Svekssom, Stig, to Ramnas Bruks Aktiebolag. Chain hook. 3,673,646, Cl. 24-230.5cr.
Svenska Dataregister AB: *See*—
Mattsson, Mats Erik; Eriksson, Bjorn Sven Hilding; and Lindelow, Claes-Goran, 3,674,199.
Swanson, Kenneth B.: *See*—
Kish, George R.; and Swanson, Kenneth B., 3,674,954.
Swanson, Raymond W. Releasable automatic fastener for a truck stake and like. 3,674,304, Cl. 296-43.000.
Swanwick, Barry Frederick; West, Ernest; and Cuthbertson, John Harry, to S. A. Monk Sutton-in-Ashfield Limited. Yarn carrier driver means for vee bed knitting machines. 3,673,819, Cl. 66-126.000.
Sweeney, Richard F.; Khan, Aziz Urrehman; Price, Alson K.; Jones, Edward Stephen; and Otto, Julian A., to Allied Chemical Corporation. Derivatives pyridinium of polyfluoroisoalkoxy-alkanamides. 3,674,800, Cl. 260-295.0am.
Swillinger, Francis L., to Libbey-Owens-Ford Company. Exit sealing drape for float glass bath. 3,674,456, Cl. 65-182.00r.
Swinkels, Dominicus A. J.: *See*—
Bradley, Thompson G.; and Swinkels, Dominicus A. J., 3,674,567.
Sybron Corporation: *See*—
Anderson, John Ray; and Hollingworth, Richard Peck, 3,674,466.
Griswold, Augustus W.; and Tompkins, James R., 3,673,853.
Snyder, John Sommerville, 3,675,003.
Sylvania Electric Products, Inc.: *See*—
Jayne, Max L.; and Pihlblad, Robert W., 3,675,186.
Shaffer, John W., 3,674,411.
Syntex Corporation: *See*—
Edwards, John A.; Fried, John H.; and McCrae, William, 3,674,816.
Throop, Lewis J., 3,674,778.
Szempruch, Robert S.: *See*—
Giardini, Dante S.; and Szempruch, Robert S., 3,673,740.
Szerejko, Walter J.: *See*—
Bock, Herbert G.; and Szerejko, Walter J., 3,673,762.
Szyfter, Bruno. Floatable breakwater element. 3,673,805, Cl. 61-5.000.
Tachikawa, Kyoji; Tanaka, Yoshiaki; and Fukuda, Satoshi, to National Research Institute for Metals, Director of. Superconductor and its manufacturing method. 3,674,553, Cl. 117-217.000.
Tada, Fusao; Inamine, Seiei; and Hatanaka, Tsutomu, to Sakai Chemical Industry Company Limited. Process for manufacturing trialkyl phosphites. 3,674,897, Cl. 260-976.000.
Tada, Shotaro: *See*—
Kurauchi, Noritaka; Tada, Shotaro; Shima, Hiroshi; Hiraoka, Susumu; Nagao, Taichiro; Koyama, Masahiro; Shiraishi, Satoshi; Shindo, Masuo; and Kobayashi, Yoshinobu, 3,674,990.
Taddei, Carlo, to Seal Spout Europe S.p.A. Machine for applying pouring spouts to containers. 3,673,663, Cl. 29-200.00a.
Tahara, Tadasu: *See*—
Suzuki, Reiichi; Tahara, Tadasu; and Mototani, Hideo, 3,674,769.
Takano, Kiyoshi: *See*—
Sakka, Toshikatsu; and Takano, Kiyoshi, 3,675,111.
Takao, Hiroyoshi: *See*—
Yamamoto, Keisaku; Takao, Hiroyoshi; Hirooka, Masaaki; and Oshima, Teruo, 3,674,755.
Takeda Chemical Industries, Ltd.: *See*—
Yamatodani, Saburo; and Kanamaru, Tsuneo, 3,674,642.
Takeda, Hitoshi: *See*—
Yoshiyama, Masami; Sato, Teruo; and Takeda, Hitoshi, 3,674,928.
Takeda, Isao; Iguchi, Takashi; Tsuzuki, Katsuaki; and Nakano, Tooru, to Asahi Kasei Kogyo Kabushiki Kaisha. Cultivation of hydrocarbon-consuming yeasts. 3,674,639, Cl. 195-28.00r.
Takeshima, Masumi: *See*—
Teramoto, Iwao; Iwasa, Hitoo; Miyai, Yukio; and Takeshima, Masumi, 3,675,161.
Takeuchi, Satoru: *See*—
Matsubara, Mitio; Yagyu, Shigeyuki; and Takeuchi, Satoru, 3,674,533.
Tallman, Richard L.: *See*—
Gulbrasen, Earl A.; Tallman, Richard L.; Andrew, Kenneth F.; and Buzalski, Bruce T., 3,675,004.
Talonn, Daniel A.: *See*—
Burlis, Norbert W.; and Talonn, Daniel A., 3,674,404.
Talvalkar, Shashikant G.: *See*—
Blose, James H.; and Talvalkar, Shashikant G., 3,674,535.

Tamai, Yasuo; and Miyazuka, Hajime, to Fuji Photo Film Co., Ltd. Process for producing photoconductive layer for electrophotography. 3,674,476, Cl. 96-1.800.

Tamura, Yoshitaka: *See—*
Nagasawa, Taro; Tomita, Mamoru; Obayashi, Tomokazu; Tamura, Yoshitaka; and Kenmotsu, Yoko, 3,674,500.

Tanaka, Edward Y.; Cossaart, Darrel D.; and Edwards, Norman B., to California Computer Products, Inc. Method of circuit board with solder coated pattern. 3,673,680, Cl. 29-626.000.

Tanaka, Katsunobu; Nara, Takashi; Misawa, Masanaru; and Komuro, Toshio, to Kyowa Hakko Kogyo Co., Ltd. Process for producing 5'-purine nucleotides. 3,674,641, Cl. 195-28.00n.

Tanaka, Toru: *See—*
Iwasaki, Koichiro; Yamaguchi, Kazuo; Kimura, Harutaka; Hasuo, Masayoshi; and Tanaka, Toru, 3,674,764.

Tanaka, Yoshiaki: *See—*
Tachikawa, Kyoji; Tanaka, Yoshiaki; and Fukuda, Satoshi, 3,674,553.

Tanenhaus, Martin, to United States of America, Navy. Fast laser projectile detection system. 3,675,030, Cl. 250-222.00r.

Tani, Isamu; Otsuka, Masatomi; Osaki, Yoshiyasu; and Hagino, Takuo, to Otsuka Kagaku Yakuhin Kabushiki Kaisha. Method for manufacturing protease. 3,674,646, Cl. 195-66.000.

Tani, Kenroku: *See—*
Mifune, Hideo; and Tani, Kenroku, 3,675,053.

Tanigawa, Yoshiyuki: *See—*
Hozumi, Shiro; Hirai, Kenichi; Tanigawa, Yoshiyuki; Yoshida, Katuro; and Sugihara, Kanji, 3,673,666.

Taniguchi, Kazutaka: *See—*
Haruna, Takashi; and Taniguchi, Kazutaka, 3,674,951.

Tarkan, Stuart E.: *See—*
Prill, Arnold L.; and Tarkan, Stuart E., 3,674,575.

Tarnblom, Stig-Goran Harry: *See—*
Hallstrom, Ingemar Gustaf Terje; Jarleborg, Martin Holger; and Tarnblom, Stig-Goran Harry, 3,674,570.

Tarrant, James R.: *See—*
Hahn, Richard L.; Stone, Roland L.; Tarrant, James R.; and Hunt, Lee D., 3,675,072.

Tauger, Mikhail Borisovich. Throttle divider of fluid medium flow. 3,674,047, Cl. 137-101.000.

Taylor, Lloyd D.: *See—*
Grasshoff, J. Michael; and Taylor, Lloyd D., 3,674,478.

Taylor, Michael David: *See—*
Colchester, John Edward; Carey, John Gerard; and Taylor, Michael David, 3,674,797.

Tecna Corporation: *See—*
Kitrilakis, Sotiris S., 3,674,440.

Tecnoma: *See—*
Ballu, Vincent Pierre Marie, 3,674,208.

Tee-Pak, Inc.: *See—*
Rose, Henry J.; Turbak, Albin F.; and Leahy, Thomas E., Jr., 3,674,511.
Rose, Henry J.; and Turbak, Albin F., 3,674,523.

Teijin Limited: *See—*
Hosono, Shinichi; and Kida, Kazuyoshi, 3,674,057.

Teitelbaum, Bernard R., to Bendix Corporation, The. Device for detecting leaks in vacuum or pneumatic pressure lines. 3,673,857, Cl. 3-40.50a.

Teledyne, Inc.: *See—*
Wells, Samuel G., 3,673,618.

Teleflex Products Limited: *See—*
Dove, Ernest Baker, 3,674,307.

Telefonaktiebolaget L M Ericsson: *See—*
Krantz, Tore Samuel, 3,674,960.

Telephon-und Telegraphen-Fabriks A.G.: *See—*
Wenzel, Kurt, 3,675,086.

Temple University: *See—*
Blank, Fritz; Day, William C.; Harmon, Sandra R.; Toncic, Pauline F.; and Yu, Ruey J., 3,674,645.

Templeton, John Glenn, to Rospatch Corporation. Unitary label assembly of interlinked labels. 3,674,614, Cl. 161-39.000.

Tennessee Valley Authority: *See—*
Harvey, Herbert C., Jr., 3,674,219.

Teramoto, Iwao; Iwasa, Hitoo; Miyai, Yukio; and Takeshima, Masumi, to Matsushita Electronics Corporation. Varactor-controlled PN junction semiconductor microwave oscillation device. 3,675,161, Cl. 332-16.00r.

Termin, Erich: *See—*
Dijkhuizen, Willem; Termin, Erich; Bleh, Otto; and Morgenstern, Dieter, 3,674,716.

Texas Gulf Sulphur Company: *See—*
Nielson, Stephen M., 3,674,442.

Texas Instruments, Incorporated: *See—*
Carbajal, Bernard G., III; Gosney, William Milton; and Hall, Lou H., 3,673,679.
Jones, William Stanley; and Hartmann, Clinton S., 3,675,054.
Kendall, Don Leslie, 3,674,995.
Wilson, Oran W., 3,674,712.

Texas Inventment Builders Co.: *See—*
Ragland, Douglas, 3,673,946.

Textol Systems, Inc.: *See—*
Zaruba, Wenzel; and Sehnal, Jan, 3,673,874.

Textron Inc.: *See—*
Stromberg, Sanford E., 3,674,671.

Thacker, Bernard L., Jr., to Firestone Tire & Rubber Company, The. No-twist entanglement of filament and apparatus therefor. 3,673,648, Cl. 28-1.400.

Tharp, Edwin B.: *See—*
Moroney, John J.; and Tharp, Edwin B., 3,674,325.

Thee, Alfred: *See—*
Brecker, Lawrence R.; and Thee, Alfred, 3,674,737.

Theer, Anton, to Agfa-Gevaert Aktiengesellschaft. Motion picture camera with automatically deactivatable fading means. 3,674,349, Cl. 352-91.000.

Thees, Richard, to U.S. Philips Corporation. Self starting synchronous motor having means for reducing negative torque to produce stable no load rotation. 3,675,059, Cl. 310-156.000.

Therm-O-Disc, Incorporated: *See—*
Place, Donald E., 3,675,178.

Thomas & Betts Corporation: *See—*
Bush, Harold Jesse, 3,673,894.
Eppler, Daniel, 3,674,392.

Thomas, Alfred W., to Massey-Ferguson Services N.V. Control for power take-off. 3,674,106, Cl. 180-53.000.

Thomas, David A.: *See—*
Jeffreys, Roy A.; and Thomas, David A., 3,674,493.

Thomas, Edmund C.: *See—*
Owen, James Neal; Moberly, Raymond Ronald; Martin, Edwin J., Jr.; Yamada, Akemichi; and Thomas, Edmund C., 3,675,162.

Thomas, Robert M.; Gerns, Fred R.; and Sands, John L., to Great Lakes Chemical Corporation. Dipyridylium quaternary dihalide halogen complexes. 3,674,788, Cl. 260-250.

Thompson, Don D., to Chevron Research Company. Dielectric constant measurement method. 3,675,121, Cl. 324-61.00r.

Thompson, Lloyd M. Radioactive macroaggregates of serum albumin. 3,674,900, Cl. 424-1.000.

Thornton, William S. Changeable sign. 3,673,720, Cl. 40-125.00r.

Thorpe, David, to Richmond Marine Limited. Storage containers for use in marine craft. 3,674,170, Cl. 220-18.000.

Throop, Lewis J., to Syntex Corporation. Preparation of 9,11-dichloro steroids. 3,674,778, Cl. 260-239.55d.

Tichy, Oscar A. W., to Whirlpool Corporation. Spin control for a washer-dryer. 3,674,419, Cl. 8-158.000.

Tiefenthal, Harlan E.; Jungermann, Eric; Miller, Eugene J., Jr.; and Callahan, John J., to Armour Industrial Chemical Company. Process for preparing chloro-substituted bishydroxyphenyl methanes. 3,674,879, Cl. 260-619.00a.

Tillander, Hans, to Astra-Meditec AB. Magnetically guidable catheter-tip and method. 3,674,014, Cl. 128-2.05r.

Timbie, Robert W., to Monsanto Company. Textile spindle mounting. 3,673,783, Cl. 57-135.000.

Time, Incorporated: *See—*
Chapman, Brian M., 3,674,367.

Time Research Laboratories, Inc.: *See—*
Nugent, Reginald F.; and Snyder, George P., 3,674,975.

Timmler, Helmut: *See—*
von Konig, Anita; Liebe, Werner; and Timmler, Helmut, 3,674,481.

Tingley, Frederick M., to United States of America, Air Force. Camera shutter. 3,673,942, Cl. 95-57.000.

Tirabassi, Benjamin John, to Bendix Corporation, The. Self-restoring energy absorbing stop. 3,674,251, Cl. 267-162.000.

Titus, Charles H.; and Schneider, Harold N., to General Electric Company. Cable connection for water cooler underground electrode. 3,674,912, Cl. 174-15.00c.

Tixier, Michel, to Regie Nationale des Usines Renault and Automobiles Peugeot. Methods and tools for finishing gear teeth by rolling. 3,673,837, Cl. 72-102.000.

Tkach, Khaim Berkovich: *See—*
Kostylev, Alexandr Dmitrievich; Gurkov, Konstantin Stepanovich; Tkach, Khaim Berkovich; and Lipovetsky, Lazar Moiseevich, 3,674,099.

Toepfer, Richard E.: *See—*
Hill, Robert C.; French, John M.; and Toepfer, Richard E., 3,675,019.

Tokyo Denryoku Kabushiki Kaisha: *See—*
Mitsui, Tsuneo; Baba, Jun-Ichi; and Yamada, Ikuo, 3,675,002.

Tokyo Shibaura Electric Co., Ltd.: *See—*
Kubota, Tadao; and Ida, Keisuke, 3,674,382.

Tolbert, Richard E.: *See—*
Yearout, James D.; and Tolbert, Richard E., 3,674,355.

Tomalinas, William R., Jr., to Roth-American, Inc. Playground apparatus. 3,674,262, Cl. 272-85.000.

Tomita, Mamoru: *See—*
Nagasawa, Taro; Tomita, Mamoru; Obayashi, Tomokazu; Tamura, Yoshitaka; and Kenmotsu, Yoko, 3,674,500.

Tomita, Tamaki; and Suzuki, Akira, to Toyda Koki Kabushiki Kaisha. Ball nut screw assembly. 3,673,886, Cl. 74-424.80r.

Tompkins, James R.: *See—*
Griswold, Augustus W.; and Tompkins, James R., 3,673,853.

Toms, Gerald Lance, to English Clays Lovering Pochin & Company Limited. Pigments. 3,674,529, Cl. 106-306.000.

Toncic, Pauline F.: *See—*
Blank, Fritz; Day, William C.; Harmon, Sandra R.; Toncic, Pauline F.; and Yu, Ruey J., 3,674,645.

Torii, Michihiro: *See—*
Kobayashi, Seihin; Torii, Michihiro; and Yamakawa, Fujio, 3,675,222.

Kobayashi, Seihin; Torii, Michihiro; and Suzuki, Koichiro, 3,675,223.
Torrington Company, The: *See—*
Moroney, John J.; and Tharp, Edwin B., 3,674,325.
Toseco International Limited: *See—*
Vuaroqueaux, Jean-Claude, 3,674,518.
Toussaint, Francois: *See—*
Plumat, Emile; and Toussaint, Francois, 3,674,454.
Townsend Engineering Company: *See—*
Beasley, Donald L., 3,674,071.
Toyda Koki Kabushiki Kaisha: *See—*
Tomita, Tamaki; and Suzuki, Akira, 3,673,886.
Toyo Rubber Industry Co., Ltd., The: *See—*
Sasaki, Shiro; and Shibata, Narajiro, 3,674,078.
Toyoda Koki Kabushiki Kaisha: *See—*
Kakumu, Ichizo; and Oshima, Susumu, 3,674,003.
Toyoda Koki Kaisha, t/a Toyoda Machine Works: *See—*
Koide, Tsuyoshi; and Othu, Ikuo, 3,673,741.
Trachtenberg, William, to Eastman Kodak Company. Toner concentration control apparatus. 3,674,353, Cl. 355-3.000.
Trans-World Display Corporation: *See—*
Jaquish, John, 3,674,175.
Trappmann, Klaus, to Motoren- und Turbinen-Union Munchen GmbH. Guide blading for turbo machines with adjustable guide vanes. 3,674,377, Cl. 415-147.000.
Trepka, William J.: *See—*
Uraneck, Carl A.; and Trepka, William J., 3,674,753.
Trexler, Richard R.: *See—*
Snyder, Harold I.; and Trexler, Richard R., 3,674,021.
Triax Company, The: *See—*
Lemelson, Jerome H., 3,674,159.
Triumph Werke Nurnberg AG: *See—*
Decker, Herbert; and Waldenburger, Hermann, 3,674,126.
Troisoeufs, Pierre, to Ronson Corporation. Attachment for storing flints. 3,674,412, Cl. 431-124.000.
Trolle, Stern: *See—*
Jonsson, Finn Lennart; Trolle, Stern; and von Platen, Baltzar Carl, 3,674,403.
Trondle, Alois. Compressed air operated apparatus for raising underwater deposits. 3,673,716, Cl. 37-61.000.
Trost, Joseph C.; Bock, Robert V.; Gerbstadt, Frederick H.; Graham, William J.; Miles, Wilson D.; and Questa, Charles R., to Burroughs Corporation. Autonomous multiple-path input/output control. 3,675,209, Cl. 340-172.500.
Troxler, Eduard; and Hausermann, Heinrich, to Geigy Chemical Corporation. Detergent composition containing fluorescent 1-pyrazolinylphenylsulphonyl-piperazines. 3,674,714, Cl. 252-543.000.
Troxler, Franz: *See—*
Bormann, Gerhard; Gmunder, John; Wilkens, Heinrich; and Troxler, Franz, 3,674,801.
Trust, Ida J.: *See—*
Eisenhauer, William A., 3,673,710.
TRW Inc., mesne: *See—*
Van Buren, Harold S., Jr., 3,674,233.
Tselikov, Alexandr Ivanovich; Nosal Vsevolod Vladimirovich; and Verderevsky, Vadim Anatolievich, to Vsesojuzny Naucho-Issledovatelsky and Proektnokonstruktorsky Institute Metallurgicheskogo Mashinostroeniya. Cold rolling pipe mill roller type rolling stand. 3,673,840, Cl. 72-208.000.
Tsuchida, Takashi; Hayase, Yoshiaki; and Fujisawa, Yoshirou, to Fuji Denki Kagaku Kabushiki Kaisha. Process for producing electrodes for rechargeable alkaline cells. 3,674,561, Cl. 136-29.000.
Tsuda, Motohisa; and Yoshimura, Masao, to Shimadzu Seisakusho Ltd. System for continuously varying the size of the field of an X-ray image intensifier tube. 3,675,027, Cl. 250-213.0vt.
Tsuji, Nobuo: *See—*
Shiba, Keisuke; Hinata, Masanao; Tsuji, Nobuo; and Sato, Akira, 3,674,499.
Tsujihara, Mamoru: *See—*
Shichijo, Yoshihisa; and Tsujihara, Mamoru, 3,674,416.
Tsukagoshi, Tsunehiro: *See—*
Ohshita, Masahide; and Tsukagoshi, Tsunehiro, 3,674,549.
Tsukamoto, Masaaki; Fujii, Tatsuo; and Ono, Shigeo, to Nippon Kogaku K.K. Variable zig-zag resistor with taps. 3,675,179, Cl. 338-190.000.
Tsukernik, Vitaly Borisovich: *See—*
Borkovsky, Gennady Mikhailovich; Tsukernik, Vitaly Borisovich; and Ierusalimskaya, Irina Nikolaevna, 3,675,194.
Tsuzuki, Akira; and Suzuki, Choken, to Citizen Watch Company Limited. Calendar timepiece with month advancement mechanism for 29,30, or 31 day months. 3,673,789, Cl. 58-58.000.
Tsuzuki, Katsuaki: *See—*
Takeda, Isao; Iguchi, Takashi; Tsuzuki, Katsuaki; and Nakano, Tooru, 3,674,639.
Tsvetkov, Krum Kostov; Ezekiev, Ezekiya Gueorguiev; Nikolov, Petko Petrov; and Otsetov, Vassil Christov, to DSO 'Avtomatizatsia I Priborostroene'. Automatic programming device for looms. 3,674,991, Cl. 235-92.0pd.
Tupper, Myron D.; and Hille, Arvin A., to Omark Industries, Inc. Chipper shredder. 3,674,220, Cl. 241-186.00r.
Turbak, Albin F.: *See—*
Rose, Henry J.; Turbak, Albin F.; and Leahy, Thomas E., Jr., 3,674,511.
Rose, Henry J.; and Turbak, Albin F., 3,674,523.
Turnbull John Hilton, to G.K.N. Screws & Fasteners Limited. Apparatus for tightening and locking a nut on a bolt. 3,673,662, Cl. 29-200.00b.
Turner, Charles D., to Kay Laboratories, Inc. Rupturable container. 3,674,134, Cl. 206-47.00a.
Turner, Wilson R.: *See—*
Cutler, Leonard S.; Holloway, Joseph H.; and Turner, Wilson R., 3,675,149.
Tuttle, Joey K.: *See—*
Frankeny, Richard F.; and Tuttle, Joey K., 3,675,133.
Tuwiner, Sidney B., to RAI Research Corporation. Concentration of electrolyte from dilute washings by electrodialysis in a closed system. 3,674,669, Cl. 204-180.00p.
Tyee Construction Company: *See—*
Fikse, Tyman H., 3,674,157.
Ube Industries, Ltd.: *See—*
Moritani, Ichiro; and Fujiwara, Yuzo, 3,674,884.
Uchida, Hideho: *See—*
Miyamoto, Haruo; Uchida, Hideho; and Uehara, Masaru, 3,674,621.
Udylite Corporation: *See—*
Jessup, Richard J., 3,674,673.
Udylite Corporation, The: *See—*
Juve, Robert J., 3,674,127.
Ueda, Isao; Kageyama, Takao; and Inomata, Isao, to Nippon Electric Company, Limited. Waveguide window for transmission or electromagnetic waves. 3,675,165, Cl. 333-98.00p.
Ueda, Tadao; Sato, Kenji; and Nakamura, Yasusi, to Asahidenka Kogyo Kabushiki Kaisha. Process for producing crystalline zeolite A. 3,674,426, Cl. 23-113.000.
Uehara, Hiroshi: *See—*
Kawasaki, Jun; and Uehara, Hiroshi, 3,675,219.
Uehara, Masaru: *See—*
Miyamoto, Haruo; Uchida, Hideho; and Uehara, Masaru, 3,674,621.
Uematsu, Takao: *See—*
Yamawaki, Takeshi; Usami, Masakatsu; Suzuki, Tetsumi; and Uematsu, Takao, 3,674,759.
Uffner, Melville W., to Air Products and Chemicals, Inc. Olefin extrusion compositions and method of preparing same. 3,674,757, Cl. 260-86.700.
UID Electronics Corporation: *See—*
Brevick, Arnold A., 3,674,953.
Wright, Thomas H., Jr., 3,674,961.
Ullmann, Christoph: *See—*
Canamero, Ernest V.; and Ullmann, Christoph, 3,673,760.
Unarco Industries, Inc.: *See—*
Bertram, Leroy W., 3,673,968.
Underwater Storage, Inc.: *See—*
Quase, Harold G., 3,674,687.
Ungar, Israel S.: *See—*
Scher, Herbert I.; and Ungar, Israel S., 3,674,619.
Union Carbide Canada Limited: *See—*
Hakka, Leo E.; Bata, George L.; and Hazell, John E., 3,674,439.
Union Carbide Corporation: *See—*
Bennett, Roswell J., 3,674,563.
Collins, Joseph John, 3,674,429.
Fitton, Peter; and Rick, Edward A., 3,674,825.
Niegisch, Walter D., 3,674,623.
Purcell, Chester L.; and Smarook, Walter H., 3,674,896.
Wheeler, Marshall L., Jr., 3,674,891.
Union Insulating Company, Inc.: *See—*
Arnold, William O., Jr., 3,673,670.
Union Oil Company of California: *See—*
Jamison, Robert W.; and Norcross, Paul A., 3,675,199.
Uniroyal Englebert France S.A.: *See—*
Leblond, Jean, 3,674,582.
Leblond, Jean, 3,674,603.
Uniroyal, Inc.: *See—*
Adams, Gerald E., 3,673,883.
Amidon, Roger W.; and Gencarelli, Richard A., 3,674,824.
Uniroyal Ltd.: *See—*
Smiley, Yale H., 3,674,222.
Unitec Industries, Inc.: *See—*
Cooke, Robert F., 3,674,110.
United Aircraft Corporation: *See—*
Mack, Michael E., 3,675,151.
United Gas-Industries Limited: *See—*
Wade, Kenneth R., 3,674,410.
United Kingdom Atomic Energy Authority: *See—*
Jones, Philip Michael; and Walsh, Raymond Herbert, 3,674,636.
Watson, Christopher John Hamilton, 3,674,634.
United Medical Laboratories Inc.: *See—*
Michel, Raymond S.; and Podhora, Fred W., 3,674,011.
United Merchants and Manufacturers, Inc.: *See—*
Lyons, Richard J.; and Dabrowski, Jan, 3,674,418.
United States Envelope Company: *See—*
Stone, Ralph K., 3,674,195.
United States of America
Agriculture: *See—*
Pittman, Allen G.; and Wasley, William L., 3,674,820.
Air Force: *See—*

Clow, William L.; Benzing, Robert J.; and McConnell, Bobby D., 3,674,690.
Dugger, Cortland O., 3,674,455.
Randle, Walter N.; Spieth, Howard H.; and English, William D., 3,673,871.
Tingley, Frederick M., 3,673,942.
Army: *See—*
Johnson, Henry V., 3,674,225.
Atomic Energy Commission: *See—*
Hahn, Richard L.; Stone, Roland L.; Tarrant, James R.; and Hunt, Lee D., 3,675,072.
Atomic Energy Commission, mesne: *See—*
Nelson, Melvin A.; Lackey, Jerry G.; and Davies, Terence J., 3,675,022.
Health, Education and Welfare: *See—*
Law, John H., 3,674,818.
Navy: *See—*
Asbelle, Charles C.; Arrigo, Michael F.; Hunting, Kenneth E.; and Helmuth, Gene R., 3,673,613.
De Simone, David N., 3,673,609.
Derderian, George; and De Clerk, Joseph L., 3,675,012.
Di Crispino, Joseph S.; and Kaldor, Leslie M., 3,673,862.
Hansen, Neil W.; and Orenstein, Nathan, 3,675,132.
Heckman, Paul J., Jr., 3,674,925.
Lindsay, George F.; and Whitehouse, Harper John, 3,675,052.
MacKenzie, Gerald L.; and Mosher, Paul R., 3,674,702.
Neuhaus, Herbert M., 3,674,407.
Soli, Giorgio, 3,674,648.
Tanenhaus, Martin, 3,675,030.
Navy, mesne: *See—*
Gooding, Otis E.; and Dixon, Alton E., 3,674,934.
United States Steel Corporation: *See—*
Emerson, William A.; and Redmond John A., 3,674,971.
United Tool Processes Corporation: *See—*
Reed, Everett E.; and Boynton, James S., 3,674,375.
United-Carr, Incorporated: *See—*
Vetter, Ottomar H., 3,675,184.
Universal Water Corporation: *See—*
Manjikian, Serop, 3,674,152.
Universitat Stuttgart: *See—*
Mayer Rolf; and Reitinger, Johann, 3,674,977.
University of Delaware: *See—*
Spinski, Victor, 3,674,484.
Upjohn Company, The: *See—*
Hester, Jackson B., Jr., 3,674,777.
Visser, Jeronimo, 3,674,647.
Uraneck, Carl A.; and Trepka, William J., to Philips Petroleum Company. Stabilization of polymer-alkali metal mercaptides. 3,674,753, Cl. 260-79.000.
Urbanosky, Harold J., to Schlumberger Technology Corporation. Methods for inhibiting the entrance of loose formation materials into a well bore. 3,674,090, Cl. 166-276.000.
U.S. Atomic Energy Commission under the provisions of 42 U.S.C. 2182: *See—*
Ensley, Donald L., 3,673,872.
U.S. Philips Corporation: *See—*
Freeland, William, 3,674,151.
Thees, Richard, 3,675,059.
Verhoeff, Jacobus, 3,675,202.
Yperman, Jean Michel Baudry Ghislain; and Belhomme, Charles, 3,674,713.
U.S. Philips Corporation, mesne: *See—*
Jonker, Hendrik; Janssen, Casper Johannes Gerardus Ferdinand; and Postma, Lambertus, 3,674,485.
Roos, Jan, 3,674,629.
Usami, Masakatsu: *See—*
Yamawaki, Takeshi; Usami, Masakatsu; Suzuki, Tetsumi; and Uematsu, Takao, 3,674,759.
USM Corporation: *See—*
Annis, Rupert E., Jr.; and Kyritsis, William T., 3,674,401.
Usui, Noriyuki: *See—*
Kurokawa, Junji; Arai, Fumiaki; and Usui, Noriyuki, 3,674,474.
Vactronics Incorporated: *See—*
Selley, Wilbur-Webb, 3,674,287.
Vahlstrom, Richard E.; Nutten, Donald C.; and Bayne, Dennis R., to Northrop Corporation. Precision pulse generator. 3,675,047, Cl. 307-260.000.
Valvassori, Alberto: *See—*
Cameli, Nazzareno; Longi, Paolo; and Valvassori, Alberto, 3,674,754.
van Asperen, Pieter J.; and van der Loos, Jozef L. M., to Stamicarbon N.V. Fillers for metallized polyamides. 3,674,658, Cl. 204-30.000.
Van Buren, Harold S., Jr., to TRW Inc., mesne. Hanger system. 3,674,233, Cl. 248-68.000.
van de Kerkhof, Lodevicus Lambertus Johannes, to AMP Incorporated, mesne. Round socket applicator. 3,673,847, Cl. 72-405.000.
Van Der Grinten N.V.: *See—*
Dols, Wilhelmus Emilius Maria, 3,673,985.
van der Loos, Jozef L. M.: *See—*
van Asperen, Pieter J.; and van der Loos, Jozef L. M., 3,674,658.
Van der Meulen, Johan: *See—*
Brants, Johannes Petrus; and Van der Meulen, Johan, 3,674,522.
van Driel, Hendrik, to N.V. Chefaro Maatschappij. Organic diacyl peroxides. 3,674,855, Cl. 260-607.00a.
Van Hattem, Nicolaas: *See—*
Plate, Geerardus G.; and Van Hattem, Nicolaas, 3,673,879.
Van Luik, Frank W.; and Coffey, Peter E., to Evironment/One Corporation. Low concentration constituent of gaseous mixture selective converter and detector. 3,674,435, Cl. 23-232.00r.
van Nassau, Petrus J. M.: *See—*
Kaasenbrood, Petrus J. C.; and van Nassau, Petrus J. M., 3,674,847.
Van Ryn, Edwin; and Driesenga, Edwin J., to Keeler Brass Company. Drawer pull. 3,673,634, Cl. 16-126.000.
Van Thyne, Ray J.; and Rausch, John J., to Surface Technology Corporation. Nitrided zirconium alloys. 3,674,571, Cl. 148-31.500.
Van Thyne, Ray J.; and Rausch, John J., to Surface Technology Corporation. Nitrided tantalum, columbium and vanadium-rich alloys. 3,674,572, Cl. 148-31.500.
Van Thyne, Ray J.; and Rausch, John J., to Surface Technology Corporation. Nitrided surface treated alloys. 3,674,573, Cl. 148-31.500.
Van Thyne, Ray J.; and Rausch, John J., to Surface Technology Corporation. Nitrided surface modified alloys. 3,674,574, Cl. 148-31.500.
Van Tongerloo, Eric H.: *See—*
Hantusch, Gerald H.; Vincent, David A.; and Van Tongerloo, Eric H., 3,675,089.
Van Vliet, Raymond A.: *See—*
Fairfield, Louis R., Jr.; Van Vliet, Raymond A.; and McLauchlan, Thomas A., 3,674,065.
van-der-Ben, Charles Robert; and Pope, Joseph Albert, to Mirrlees Blackstone Limited. Alloy cast iron. 3,674,576, Cl. 148-35.000.
Vanderbilt, Byron M.; and Fasnacht, James J., said Vanderbilt assor. to, Esso Research and Engineering Company, said Fasnacht assor. to and PPG Industries, Inc. Glass fibers sized with a composition comprising a vinylic aromatic-diolefin copolymer and a hydrolyzable silane. 3,674,542, Cl. 117-72.000.
Vanderhoef, John P.: *See—*
Bell, Randall P.; and Vanderhoef, John P., 3,673,724.
Lazar, Burton A.; Bell, Randall P.; and Vanderhoef, John P., 3,673,723.
Vanlerberghe, Guy: *See—*
Kalopissis, Gregoire; and Vanlerberghe, Guy, 3,674,902.
Vardaman, Hunter W., to Mekatron Corporation. Spiral actuated adjustable jaw wrench. 3,673,896, Cl. 81-165.000.
Vargiu, Silvio: *See—*
Pitzalis, Mario; Vargiu, Silvio; and Nistri, Ugo, 3,674,732.
Varian Associates: *See—*
Benz, Hanspeter, 3,674,998.
Growald, Bert; Dahlquist, John A.; and Marlor, Guy A., 3,674,711.
Varian Associates, mesne: *See—*
Michle, James A.; Pratt, David S.; and Rees, Robert M., 3,675,204.
Varlonga, Giovanni. Metal forms having a particular shape for realizing suspended floors. 3,674,232, Cl. 249-23.000.
Varner, George C., to Deering Milliken Research Corporation. Method for producing endless reinforcements for vulcanized pneumatic tires. 3,674,079, Cl. 152-361.000.
Vastano, Alphonso N., to Volupte, Inc. Cosmetic container. 3,674,039, Cl. 132-82.
Vautier, Roger: *See—*
Globus, Anatol; Duplex, Paul; and Vautier, Roger, 3,674,218.
Vega, Fidel. Cigarette smoking means. 3,674,036, Cl. 131-7.000.
Vekony, Balazs. Garbage can lid lock. 3,674,298, Cl. 292-258.000.
Velavicius, Alfonsas: *See—*
Wanlass, Bert R.; and Velavicius, Alfonsas, 3,674,296.
Venable, Catherine M.: *See—*
Venable, Henry B.; and Venable, Catherine M., 3,674,183.
Venable, Henry B.; and Venable, Catherine M. Dispensing device. 3,674,183, Cl. 222-212.000.
Ventures Research & Development Group: *See—*
Korman, Nathaniel I., 3,674,364.
Vepa AG: *See—*
Fleissner, Heinz, 3,673,822.
Vercoglio, John W., to Olin Corporation. Tensile bending of metal panels or strip having inflatable passageways. 3,673,845, Cl. 72-318.000.
Verderevsky, Vadim Anatolievich: *See—*
Tselikov, Alexandr Ivanovich; Nosal Vsevolod Vladimirov ch; and Verderevsky, Vadim Anatolievich, 3,673,840.
Verdier, Henri, to Compagnie Generale des Etablissements Michelin raison sociale Michelin & Cie. Tire tread. 3,674,077, Cl. 152-209.000.
Verdier, Henri, to Compagnie Generale des Etablissements Michelin, raison Sociale Michelin & Cie. Wheel for high-speed cornering. 3,674,080, Cl. 152-375.000.
Verdol, Joseph A.; and Ryan, Patrick W., to Atlantic Richfield Company. Elastomers from polyhydroxy polydienes. 3,674,743, Cl. 260-73.001.
Verhoeff, Jacobus, to U.S. Philips Corporation. Device for checking a group of symbols to which a checking symbol is joined and for determining this checking symbol. 3,675,202, Cl. 340-146.1aq.

Vernaleken, Hugo; Couri, Otto; and Weirauch, Kurt, to Farbenfabriken Bayer Aktiengesellschaft. Process of producing polycarbonate. 3,674,740, Cl. 260-47.

Vetter, Ottomar H., to United-Carr, Incorporated. Combined cable clamp and seal for a backshell. 3,675,184, Cl. 339-103.0b.

Viaud, Jean-Luc: *See—*
Delafosse, Jacques; and Viaud, Jean-Luc, 3,674,637.

Viehrig, Wolfgang: *See—*
Kohler, Roland; Nagel, Erich; Hujer, Friedrich; and Viehrig, Wolfgang, 3,674,365.

Vikulina, Ninel Vladimirovna: *See—*
Bokov, Jury Sergeevich; Vikulina, Ninel Vladimirovna; Dogadkin, Boris Aristarkhovich; Erofeev, Boris Vasilievich; Larina, Anastasia Vasilievna; Lavrischev, Vadim Petrovich; Markov, Vladimir Vladimirovich; Naumova, Sofia Fadeevna; Jurina, Olge Demidovna; and Yarovaya, Galina Dmitrievne, 3,674,496.

Villanueva, Antonio R., 1/2 to Wren, Holvy. Game stick and method of manipulating it. 3,674,263, Cl. 273-1.00r.

Vincent, David A.: *See—*
Hantusch, Gerald H.; Vincent, David A.; and Van Tongerloo, Eric H., 3,675,089.

Vinson Industries, Inc.: *See—*
Vinson, Paul, 3,673,901.

Vinson, Paul, to Vinson Industries, Inc. Shuttle press. 3,673,901, Cl. 83-14.000.

VioBin Corporation, mesne: *See—*
Levin, Ezra, 3,674,657.

Virgo, James Russell, to British Steel Piling Company Limited, The. Drilling rigs. 3,674,098, Cl. 173-149.000.

Visser, Jeronimo, to Upjohn Company, The. Preparation of lincomycin analogues. 3,674,647, Cl. 195-80.00r.

Voelkl, Walter, to Siemens Aktiengesellschaft. Impregnated self-healing alternating voltage capacitor. 3,675,094, Cl. 317-258.000.

Voelz, Hans-Georg: *See—*
Schnegg, Robert; Pelousek, Herbert; Dippolhofer, Robert; Wiegreffe, Wolfgang; Voelz, Hans-Georg; and Kienast, Gerhard, 3,674,747.

Vogeleer, George B.: *See—*
Brunner, Hans A.; and Vogeleer, George B., 3,673,834.

Vogeli, Rudolf, to Lebag Leitungs-und Elektrobau AG. Fall-prevention safety device. 3,674,116, Cl. 188-67.000.

Vogelsberg, Walter H., to Wheaton Industries. Silicon controlled rectifier forward and reverse shift register. 3,675,044, Cl. 307-221.00b.

Vogg, Erwin: *See—*
Stadler, Georg; and Vogg, Erwin, 3,674,694.

Vogt, Wilhelm; Sennewald, Kurt; and Glaser, Hermann, to Knapsack Aktiengesellschaft. Production of glycerol acetates. 3,674,839, Cl. 260-491.000.

Vogt, Willy: *See—*
Sauerbruch, Ernst; Scherrer, Donat; and Vogt, Willy, 3,674,400.

Voitsekhovsky, Bogdan Vyacheslavovich; Zuev, Alfred Alexandrovich; Plaxin, Vladimir Nikolaevich; and Makarov, Valery Nikolaevich. Hydraulic press. 3,673,849, Cl. 72-448.000.

Volbeda, Johan H., to Nederlandse Maatschappij voor werken Buitengaats Netherlands Offshore Company N.V. Method of and apparatus for burying sub-sea pipelines, cables and the like. 3,673,808, Cl. 61-72.400.

Volkert, Otto: *See—*
Hoffmann, Horst; Krauch, Carl Heinrich; Otto, Hans-Werner; and Volkert, Otto, 3,674,494.

Volkmann, Dieter; and Lange, Wilfried. Control valve means for a percussion device actuated by compressed air. 3,673,923, Cl. 91-309.000.

Vollmer, Udo: *See—*
Stier, Otto; Kuhn, Heinz; and Vollmer, Udo, 3,674,083.

Vollmer Werke Maschinenfabrik GmbH: *See—*
Stier, Otto; Kuhn, Heinz; and Vollmer, Udo, 3,674,083.

Volupte, Inc.: *See—*
Vastano, Alphonso N., 3,674,039.

Von Beckmann, Helmut Rolf Erich: *See—*
Bencsics, Odon Steven; and Von Beckmann, Helmut Rolf Erich, 3,675,233.

von Konig, Anita: *See—*
Kampfer, Helmut; von Konig, Anita; Ranz, Erwin; von Rintelen, Harald; Mayer, Dietmar; and Sasse, Klaus, 3,674,479.
Kampfer, Helmut; Von Konig, Anita; Ranz, Erwin; von Ritelen, Harald; Mayer, Dietmar; and Sasse, Klaus, 3,674,480.

von Konig, Anita; Liebe, Werner; and Timmler, Helmut, to Agfa-Gevaert Aktiengesellschaft. Image receiving material for the silver salt diffusion process. 3,674,481, Cl. 96-29.000.

von Platen, Baltzar Carl: *See—*
Jonsson, Finn Lennart; Trolle, Stern; and von Platen, Baltzar Carl, 3,674,403.

von Rintelen, Harald: *See—*
Kampfer, Helmut; von Konig, Anita; Ranz, Erwin; von Rintelen, Harald; Mayer, Dietmar; and Sasse, Klaus, 3,674,479.

von Ritelen, Harald: *See—*
Kampfer, Helmut; Von Konig, Anita; Ranz, Erwin; von Ritelen, Harald; Mayer, Dietmar; and Sasse, Klaus, 3,674,480.

Von Tobel, Hans, to Sandoz Ltd. Phthaloc-anine compounds. 3,674,783, Cl. 260-242.000.

Vrancken, Marcel Nicolas; Brinckman, Eric Maria; and Heugebaert, Frans Clement, to Agfa-Gevaert. Reproduction method. 3,674,483, Cl. 96-33.000.

Vredenburgh, Walter A.; and Hollis, Samuel D., to Pennsylvania Industrial Chemical Corporation. Alkylphenol-aldehyde resins. 3,674,723, Cl. 260-3.000.

Vsesojuzny Naucho-Issledovatelsky: *See—*
Tselikov, Alexandr Ivanovich; Nosal Vsevolod Vladimirovich; and Verderevsky, Vadim Anatolievich, 3,673,840.

Vuaroqueaux, Jean-Claude, to Toseco International Limited. Refractory dressing method. 3,674,518, Cl. 106-38.270.

Wacker-Chemie G.m.b.H.: *See—*
Nitzsche, Siegfried; Kaiser, Wolfgang; Wohlfarth, Ernst; and Hittmair, Paul, 3,674,738.

Wade, Kenneth R., to United Gas-Industries Limited. Apparatus for controlling the operation of fuel burners. 3,674,410, Cl. 431-74.000.

Wahlen, Werner; and Blumber, Hans, to Kapafar Business Trust Reg. Apparatus for cutting slots or grooves in punch support plates or the like. 3,673,920, Cl. 90-58.00b.

Walbeck, Maude E. Golfing accessories holder. 3,674,189, Cl. 224-5.00c.

Waldenburger, Hermann: *See—*
Decker, Herbert; and Waldenburger, Hermann, 3,674,126.

Walford, Gordon L.: *See—*
Shen, Tsung-Ying; Witzel, Bruce E.; and Walford, Gordon L., 3,674,843.
Shen, Tsung-Ying; Jones, Howard; Witzel, Bruce E.; and Walford, Gordon L., 3,674,844.
Shen, Tsung-Ying; Ruyle, William V.; Witzel, Bruce E.; and Walford, Gordon L., 3,674,875.

Walker, Brian Allison, to Chrysler United Kingdom Limited. Windscreen washing devices. 3,674,967, Cl. 200-156.000.

Walker, Grant W.: *See—*
Young, Bruce O.; Walker, Grant W.; Ford, Duane B.; and Seegmiller, Wan, 3,674,115.

Walker, Lynn P.: *See—*
Oleszko, Thaddeus J.; and Walker, Lynn P., 3,674,890.

Walker, Robert R., Jr.: *See—*
Babb, Billy W., 3,674,288.

Wallhausser, Karl Heinz: *See—*
Lindner, Fritz; Wallhausser, Karl Heinz; and Huber, Gerhard, 3,674,866.

Walsh, Raymond Herbert: *See—*
Jones, Philip Michael; and Walsh, Raymond Herbert, 3,674,636.

Walters, Emmett L.: *See—*
Beckham, Robert R.; Walters, Emmett L.; Brown, Jack G.; De Rose, Kenneth M.; and Ryan, Joseph D., 3,673,981.

Walters, John: *See—*
Cavalucci, Ralph; and Walters, John, 3,673,706.

Wanlass, Bert R.; and Velavicius, Alfonsas, to General Motors Corporation. Closure dovetail arrangement. 3,674,296, Cl. 292-216.000.

Ward, John P.: *See—*
Molloy, Kenneth H.; Ward, John P.; and Benson, Victor Mark, 3,675,196.

Warne, Leland C.: *See—*
Armstrong, James B.; Schott, Dan J.; and Warne, Leland C., 3,675,066.

Warne, Leland C., to Sperry Rand Corporation. Planar gas discharge indicator. 3,675,065, Cl. 313-109.500.

Warner Electric Brake & Clutch Company: *See—*
Buisker, Raymond A., 3,674,122.

Warren, Edward L. Educational device employing polarized plastic material. 3,674,906, Cl. 35-48.00r.

Washburn, Frank R. Off-shore fire and pollution control system. 3,673,804, Cl. 61-1.00f.

Washimi, Koichi; Kanbayashi, Masaaki; Kanai, Toshio; and Fujimori, Akihiro, to Kureha Kagaku Kogyo Kabushiki Kaisha and Chiyoda Kako Kensetsu Kabushiki Kaisha. Process and apparatus for the thermal cracking of heavy hydrocarbon oils. 3,674,679, Cl. 208-48.000.

Wasley, William L.: *See—*
Pittman, Allen G.; and Wasley, William L., 3,674,820.

Wassell, George W., to Barry, Wright, Corporation, mesne. Record card book. 3,673,721, Cl. 40-104.070.

Wasson, Gene B. Attitude indicator. 3,673,696, Cl. 33-348.000.

Wasson, Gene B. Attitude indicator. 3,673,697, Cl. 33-348.

Wasson, Richard Z., to Federal Sign and Signal Corporation. Aircraft parking method and means. 3,674,226, Cl. 244-114.00r.

Watanabe, Akihiro: *See—*
Higuchi, Noboru; Ogawa, Yutaka; and Watanabe, Akihiro, 3,674,519.

Watanabe, Shigeru; and Ito, Michinobu, to Showa Zoki Co., Ltd. Automatic spring feed device for a spring grinder. 3,673,745, Cl. 51-215.0hm.

Watanabe, Takashi, to Kabushiki Kaisha Towa Denki. Rotary cutter. 3,673,907, Cl. 83-674.000.

Water and Gas Plastics Products: *See—*
Porter, Donald E.; and Burkholder, Jack, 3,674,235.

Waterman, Jacques Abraham; Shaham, Ilan; and Shorr, Leonard M., to Israel Mining Industries-Institute for Research and Development. Copolymerization of allyl fluoride. 3,674,756, Cl. 260-80.810.

Waters Associates, Inc.: *See—*
Waters, James L.; Abrahams, Louis; and Hutchins, Burleigh M., Jr., 3,674,373.

Waters, James L.; Abrahams, Louis; and Hutchins, Burleigh M., Jr., to Waters Associates, Inc. Differential refractometer. 3,674,373, Cl. 356-130.000.

Watson, Cbristopher John Hamilton, to United Kingdom Atomic Energy Authority. Plasma confinement apparatus. 3,674,634, Cl. 176-3.000.

Wayman, Cecil John, to General Electric Company Limited, The. Read-out circuits for electrical position-encoders. 3,675,235, Cl. 340-347.00p.

Waynco, Inc.: *See*—
Harkenrider, Robert J.; and Moe, John L., 3,675,046.

Webb, Richard V.; and Batesky, Donald C., to Eastman Kodak Company. Method of preparing poly(copperphthalocyanine). 3,674,805, Cl. 260-314.50r.

Webber, J. Alan, to Lilly, Eli, and Company. 3-Formyl cephalosporin sulfoxides. 3,674,784, Cl. 260-243.00c.

Weber, Edwin J., to Black and Decker Manufacturing Company, The. Blade mounting means. 3,673,777, Cl. 56-17.500.

Weber, Heinz Paul: *See*—
Kaminow, Ivan Paul; and Weber, Heinz Paul, 3,675,157.

Webster, Edward Ernest: *See*—
Jones, David Thomas; Jowett, George Edward; and Webster, Edward Ernest, 3,674,030.

Weiche, Hans-Joachim, to Linde Aktiengesellschaft. Method of and device for cryogenic surgery. 3,674,031, Cl. 128-303.100.

Weick, Louis F.; and Linne, William F., to Caterpillar Tractor Company. Anticipating air injection system for turbocharged engines. 3,673,796, Cl. 60-13.000.

Weil, Edward D., to Stauffer Chemical Company. Transmitting pressure in a hydraulic system. 3,674,698, Cl. 252-78.000.

Weinfurt, William J., to McGraw-Edison Company. Code transmitter having intermittent drive mechanism. 3,675,237, Cl. 340-357.000.

Weir, Donald Robert: *See*—
Evans, David J. I.; and Weir, Donald Robert, 3,674,465.

Weirauch, Kurt: *See*—
Vernaleken, Hugo; Court, Otto; and Weirauch, Kurt, 3,674,740.

Weissberg, Ernest. Emergency evacuation means for ski chairlifts. 3,674,111, Cl. 182-72.000.

Welch, Archibald H., to Converters Incorporated. Method and apparatus for fan-folded stacking. 3,674,254, Cl. 270-79.000.

Welker, Robert H.; and Halmbrecht, William L., to Libbey-Owens-Ford Company. Sheet edging apparatus. 3,673,737, Cl. 51-38.000.

Welle, Dieter, to Etimex Interplastic GmbH. Apparatus for producing and decorating hollow bodies made of thermoplastic material. 3,674,391, Cl. 425-109.000.

Weller, David Reis, to Bell Telephone Laboratories, Incorporated. Sample-and-hold circuit. 3,675,135, Cl. 328-151.000.

Wellman, James W., Jr. Magnetic clutch coupling for monitoring shaft rotation. 3,675,170, Cl. 335-207.000.

Wells Manufacturing Corporation: *See*—
Evans, David T., 3,673,903.

Wells, Robert A.; and Strobe, Carl J., to SMW Atlanta, Inc., mesne. Easy-opening containers. 3,674,172, Cl. 220-54.000.

Wells, Samuel G., to Teledyne, Inc. Folding bed arrangement. 3,673,618, Cl. 5-164.000.

Welsh, Clarence E.: *See*—
Rohde, Robert P.; Welsh, Clarence E.; and Engelhardt, Hans, 3,674,385.

Welsh, Luther: *See*—
Hoyt, Edwin D.; and Welsh, Luther, 3,674,982.

Welter, Clarence J.; and Ristic, Miodrag, to Diamond Laboratories, Inc. Anaplasmosis vaccines. 3,674,860, Cl. 424-88.

Welty, Albert B., Jr., to Esso Research and Engineering Company. Process for decomposing ammonium sulfate into ammonium bisulfate and ammonia. 3,674,427, Cl. 23-119.000.

Wendt, John S., Jr. Centrifugal separator with means controlling flow. 3,674,206, Cl. 233-19.00a.

Wennergren, Johan Jakob; and Samuelsson, Lars-Gunnar. Process for moisture stabilizing cellulosic sheet material using a polyoxyalkylene glycol and a polyoxyethylene-oxypropylene glycol block polymer. 3,674,632, Cl. 162-168.000.

Wenzel, Kurt, to Telephon-und Telegraphen-Fabriks A.G. Electrical element laminated in structure. 3,675,086, Cl. 317-230.000.

Werkmeister, Dennis W.: *See*—
Bayless, Robert G.; Shank, Charles P.; Botham Ruth A.; and Werkmeister, Dennis W., 3,674,704.

Werner, Edward E.; and Wollangk, Edward G., to Kimberly-Clark Corporation. Tampon insertion device. 3,674,026, Cl. 128-263.000.

Werner Lahara, Inc.: *See*—
Arganbright, Ned H.; Koepnick, Paul J.; Nelson Carl T.; and O'Brien, Arthur F., 3,673,949.

Werner, Lincoln Harvey, to Ciba-Geigy Corporation. Basic ethers of 1-hydroxyphenylbenacycloalkane-2-spirocycloalkyl derivatives. 3,674,796, Cl. 260-295.50s.

Werotte, Louis E.: *See*—
Carbonnel, Jack V.; Grammont, Paul D.; and Werotte, Louis E., 3,674,728.

Wesbey, William H.: *See*—
Fazio, James A.; and Wesbey, William H., 3,674,931.

Wesley, Michael A.: *See*—
Raviv, Josef; and Wesley, Michael A., 3,675,212.

West, Ernest: *See*—
Swanwick, Barry Frederick; West, Ernest; and Cuthbertson, John Harry, 3,673,819.

Westberg, Vernon C. Combined tachometer and maximum speed limiting device. 3,673,992, Cl. 123-118.000.

Western Electric Company, Incorporated: *See*—
Abraham, Bruce C.; Fegley, Charles R.; and Lougher, George B., III, 3,674,141.

Western Electric Company, Incorporated, mesne: *See*—
Haven, Roger Lindsy, 3,675,049.

Westinghouse Electric Corporation: *See*—
Gulbrasen, Earl A.; Tallman, Richard L.; Andrew, Kenneth F.; and Buzalski, Bruce T., 3,675,004.

Westvaco Corporation: *See*—
Michaelsen, Alfred L., 3,673,865.

Weyerhaeuser Company: *See*—
Bell, Jack T.; and Smith, Barton K., 3,673,764.
Brookhyser, Byron B., 3,674,256.
Fairfield, Louis R., Jr.; Van Vliet, Raymond A.; and McLauchlan, Thomas A., 3,674,065.
Geib, Thomas E., 3,675,015.
Striplin, Charles D., 3,673,928.

Weyrauch, Adolf, to Zeiss, Carl,-Stiftung d.b.a., Carl Zeiss. Means for measuring position changes of two relatively movable members. 3,674,372, Cl. 356-169.000.

Weyrauch, George T.: *See*—
Schaab, Carl K.; Weyrauch, George T.; and Davis, Terry R., 3,674,589.

Wheaton Industries: *See*—
Vogelsberg, Walter H., 3,675,044.

Wheeler, Marshall L., Jr., to Union Carbide Corporation. Non-cross-linked olefinic siloxane-organic polymer graft copolymers. 3,674,891, Cl. 260-827.000.

Whirlpool Corporation: *See*—
Ripsco, William B.; and Dietrich, John W., 3,673,824.
Tichy, Oscar A. W., 3,674,419.

White, Donald A., to Digital Equipment Corporation. Universal bus arrangement for data processing systems. 3,675,083, Cl. 317-101.000.

White, Kenneth N.; and Meyer, Harold E. Slipjointed knockdown cabinet. 3,674,328, Cl. 312-263.000.

White, William A.: *See*—
Ludwig, Nelson H.; and White, William A., 3,674,869.

Whitehead & Kales Company: *See*—
Peisner, Israel D.; Stol, George H.; and Gotcher, Eugene D., 3,673,969.

Whitehouse, Harper John: *See*—
Lindsay, George F.; and Whitehouse, Harper John, 3,675,052.

Whitesell, George, to Hooker Chemical Corporation. Multiparameter process solution analyzer-controller. 3,674,672, Cl. 204-195.00r.

Whittaker Corporation: *See*—
Loewenstein, Paul; and Gorecki, Thomas A., 3,673,667.

Whyman, Barry Herbert Francis: *See*—
Desty, Denis Henry; and Whyman, Barry Herbert Francis, 3,674,409.

Whysong, Dale C.; Leininger, Dale E.; and Young, Herbert D., to General Kinetics Incorporated. Method of cleaning magnetic tape. 3,674,559, Cl. 134-9.000.

Wiandt, Ronald K.: *See*—
Kelly, Jack L.; and Wiandt, Ronald K., 3,674,277.

Wieg, Heinrich J.: *See*—
Giardini, Dante S.; and Wieg, Heinrich J., 3,673,743.

Wiegreffe, Wolfgang: *See*—
Schnegg, Robert; Pelousek, Herbert; Dippolhofer, Robert; Wiegreffe, Wolfgang; Voelz, Hans-Georg; and Kienast, Gerhard, 3,674,747.

Wieligmann, Friedrich, to Keller, C. Shrink-wrap film heating apparatus. 3,673,703, Cl. 34-225.000.

Wielt, Warren P.: *See*—
Beddows, Norman A.; Quigley, John A.; and Wielt, Warren P., 3,675,058.

Wierzbicki, John R.: *See*—
Dauber, Philip S.; Robelen, Russell J.; and Wierzbicki, John R., 3,675,217.

Wieselman, Jerome J.: *See*—
Schwartz, Leonard; Purcell, Harold K.; and Wieselman, Jerome J., 3,674,688.

Wiggins, E. B., Inc.: *See*—
Calisher, Jay V.; and Burbick, Ross E., 3,674,061.

Wilcox Electric, Inc.: *See*—
Owen, James Neal; Moberly, Raymond Ronald; Martin, Edwin J., Jr.; Yamada, Akemichi; and Thomas, Edmund C., 3,675,162.

Wilczek, Frank J.: *See*—
Keogh, Raymond J.; and Wilczek, Frank J., 3,674,602.

Wilhart, Helmut: *See*—
Judd, Frank Fuller; and Wilhart, Helmut, 3,675,158.
Judd, Frank Fuller; Lieberman, Jan Mark; and Wilhart, Helmut, 3,675,159.

Wilkens, Heinrich: *See*—
Bormann, Gerhard; Gmunder, John; Wilkens, Heinrich; and Troxler, Franz, 3,674,801.

Wilkinson, William H., to Perkins Services N.V. Compound power plant. 3,673,797, Cl. 60-13.000.

Williams, Francis A., to Eastman Kodak Company. Camera cocking mechanism. 3,673,941, Cl. 95-31.0ac.

Williams, Robert H.; and Hoehn, Marvin M., to Lilly, Eli, and Company. Pyrazomycin and process for production thereof. 3,674,774, Cl. 260-210.0ab.

Williamson, Donald E., to Cordis Corporation. Angiographic injector with pump motor starting control. 3,674,009, Cl. 128-2.00a.

Willis, Arnold L., to MSL Industries, Inc. Method of making pillows. 3,673,757, Cl. 53-21.0fw.

Wilmes, Raymond A., to Xerox Corporation. Electrostatic label printer. 3,674,352, Cl. 355-3.000.

Wilson, David G., to Massachusetts Institute of Technology. Electric guideway transportation system. 3,673,966, Cl. 104-1.000.

Wilson, George W., III: *See*—
Coats, John C.; and Wilson, George W., III, 3,674,984.

Wilson, Oran W., to Texas Instruments, Incorporated. Photoconductive detector material. 3,674,712, Cl. 252-501.000.

Wilson, Peter A.: *See*—
Rainer, Norman B.; and Wilson, Peter A., 3,674,722.

Wilson, Richard John Hugh: *See*—
Lilly, Malcolm Douglas; Kay, Garth, and; Wilson, Richard John Hugh; and Sharp, Alister Kimball, 3,674,767.

Wiltshire, Arthur J., to Structural Fibers, Inc. Method of inserting a flexible preform in a mold. 3,673,673, Cl. 29-451.000.

Wiltshire, Arthur J., to Structural Fibers, Inc. Sliding core means for the manufacture of fiber-reinforced plastic tanks. 3,674,394, Cl. 425-112.000.

Wiltshire, Arthur J., to Structural Fibers, Inc. Preform roller. 3,674,599, Cl. 425-80.000.

Windecker, Leo J., to Windecker Research, Inc. Method of making an aircraft wing structure. 3,674,585, Cl. 156-182.000.

Windecker Research, Inc.: *See*—
Windecker, Leo J., 3,674,585.

Winey, James M., to Magnepan Incorporated. Electromagnetic transducer. 3,674,946, Cl. 179-115.500.

Winn, James B., Jr., to Archilithic Co., The. Apparatus for dispensing catalyst coated fibers and cementitious material onto a surface. 3,674,600, Cl. 156-369.000.

Winn, John. Internal combustion engine. 3,673,991, Cl. 123-58.00a.

Winsler, Robert J.; and Richter, Frederic A., to Ardco, Inc. Glass panel refrigerator door. 3,673,735, Cl. 49-70.

Wiremold Company, The: *See*—
D'Aprile, Paul J., 3,674,056.

Wirtgen, Reinhard. Pole-pulling device. 3,674,239, Cl. 254-2.

Wirth, Wolf-Dieter; and Muller, Erwin, to Farbenfabriken Bayer Aktiengesellschaft. Polyesters which contain hydroxyl and carbon amide groups. 3,674,837, Cl. 260-482.00r.

Witinski, Francis D.: *See*—
Baller, Ernst O.; Crandell, Melvin G.; Pease, Donald L.; and Witinski, Francis D., 3,674,363.

Wittholz, Helge, to Dynamit Nobel Aktiengesellschaft. Rifled launching tube. 3,673,916, Cl. 89-1.816.

Witzel, Bruce E.: *See*—
Shen, Tsung-Ying; Witzel, Bruce E.; and Walford, Gordon L., 3,674,843.
Shen, Tsung-Ying; Jones, Howard; Witzel, Bruce E.; and Walford, Gordon L., 3,674,844.
Shen, Tsung-Ying; Ruyle, William V.; Witzel, Bruce E.; and Walford, Gordon L., 3,674,875.

Wlodek, Stanley Thaddeus, to Jones & Laughlin Steel Corporation. Vapor deposited zinc coated metallic substrates having organic coatings. 3,674,445, Cl. 29-195.000.

Wohlfarth, Ernst: *See*—
Nitzsche, Siegfried; Kaiser, Wolfgang; Wohlfarth, Ernst; and Hittmair, Paul, 3,674,738.

Wohrer, Luis C.: *See*—
Economy, James; Wohrer, Luis C.; and Mason, John H., 3,674,894.

Wolf, Milton; and Diebold, James L., to American Home Products Corporation. 2,10-Disubstituted-1,2,3,4-tetrahydrobenzo [b][1,6] naphthyridines useful as CNS depressants. 3,674,790, Cl. 260-286.00r.

Wolfe, Fred G., to Burroughs Corporation. Voice conference system. 3,674,936, Cl. 179-1.50r.

Wolfson, Leonard L., to Nalco Chemical Company. Control of microoganisms in industrial process waters. 3,674,457, Cl. 71-67.000.

Wollangk, Edward G.: *See*—
Werner, Edward E.; and Wollangk, Edward G., 3,674,026.

Wong, Patrick Seck-lai: *See*—
Merrill, Edward W.; and Wong, Patrick Seck-lai, 3,673,612.

Wontorsky, Alexander: *See*—
Ruehlemann, Herbert E.; and Wontorsky, Alexander, 3,675,185.

Wood, James L.: *See*—
Margrave, John L.; Badachhape, Ramachandra B.; Wood, James L.; and Lagow, Richard J., 3,674,432.

Woodall, Jerry M., to International Business Machines Corporation. Converter of electromagnetic radiation to electrical power. 3,675,026, Cl. 250-211.00j.

Worstell, Wayne C.; Cousins, Richard C.; and Cooley, Eugene A., to Dillingham Corporation. Winch braking mechanism. 3,674,119, Cl. 188-134.000.

Wren, Holvy: *See*—
Villanueva, Antonio R., 3,674,263.

Wright, David Ellis; and Hardwick, John David. Educational fluid flow system. 3,673,705, Cl. 35-19.00r.

Wright, Edward L.; and Meseck, Eugene, to Customline Control Products, Inc. Meter proving system. 3,673,851, Cl. 73-3.000.

Wright, George R. Carrier for rods with reels attached. 3,674,190, Cl. 224-5.00e.

Wright, John, to Koppers Company, Inc. Torsionally resilient shaft coupling. 3,673,813, Cl. 64-1.00v.

Wright, Thomas H., Jr., to UID Electronics Corporation. Insertable housing. 3,674,961, Cl. 200-168.00c.

Wszalek, Ferdinand J. Magnetic board game apparatus. 3,674,272, Cl. 273-130.00a.

Wuerstlin, Franz; and Feichtmayr, Franz, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Electrical insulating compositions based on olefin polymers. 3,674,695, Cl. 252-63.200.

Wunderlich, Frederich C.: *See*—
Bedker, Bruce D.; and Wunderlich, Frederich C., 3,673,832.

Wyatt, Glenn O., to Cities Service Company. Modification of feedstock oil with rubber in carbon black process. 3,674,433, Cl. 23-209.400.

Wyman, John E., to Itek Corporation. Photographic image amplifying with copper ions. 3,674,489, Cl. 96-48.000.

Xerox Corporation: *See*—
Baller, Ernst O.; Crandell, Melvin G.; Pease, Donald L.; and Witinski, Francis D., 3,674,363.
Egnaczak, Raymond K., 3,673,632.
Silverberg, Morton, 3,674,475.
Silverberg, Morton, 3,675,011.
Wilmes, Raymond A., 3,674,352.

Yagyu, Shigeyuki: *See*—
Matsubara, Mitio; Yagyu, Shigeyuki; and Takeuchi, Satoru, 3,674,533.

Yakimovich, Viktor Yakovlevich: *See*—
Berlin, Zalman Leivikovich; Bagrov, Oleg Nikolaevich; Maslovsky, Gennady Vasilievich; Serkov, Anatoly Gavrilovich; and Yakimovich, Viktor Yakovlevich, 3,673,988.

Yamada, Akemichi: *See*—
Owen, James Neal; Moberly, Raymond Ronald; Martin, Edwin J., Jr.; Yamada, Akemichi; and Thomas, Edmund C., 3,675,162.

Yamada, Ikuo: *See*—
Mitsui, Tsuneo; Baba, Jun-Ichi; and Yamada, Ikuo, 3,675,002.

Yamadai, Tadaaki; Kushida, Tadao; Konishi, Hiros..i; and Inaba, Yoshinari, to Nissan Motor Company, Limited. Windshield wipers for vehicles. 3,673,631, Cl. 15-250.420.

Yamaguchi, Kazuo: *See*—
Iwasaki, Koichiro; Yamaguchi, Kazuo; Kimura, Harutaka; Hasuo, Masayoshi; and Tanaka, Toru, 3,674,764.

Yamakawa, Fujio: *See*—
Kobayashi, Seihin; Torii, Michihiro; and Yamakawa, Fujio, 3,675,222.

Yamamoto, Hisao: *See*—
Inaba, Shigeho; Akatsu, Mitsuhiro; and Yamamoto, Hisao, 3,674,808.

Yamamoto, Keisaku; Takao, Hiroyoshi; Hirooka, Masaaki; and Oshima, Teruo, to Sumitomo Chemical Company, Limited. Process for copolymerizing alpha-monoolefins with or without a polyene, using catalyst comprising organoaluminum compound and vanadyl compound containing cyclic hydrocarbon group. 3,674,755, Cl. 260-80.780.

Yamamoto, Osamu, to Kabushikikaisha Aichidenkikosakusho. Can opener device. 3,673,682, Cl. 30-4.00r.

Yamatodani, Saburo; and Kanamaru, Tsuneo, to Takeda Chemical Industries, Ltd. Novel microbial acidic heteropolysaccharide and production thereof. 3,674,642, Cl. 195-28.00r.

Yamawaki, Takeshi; Usami, Masakatsu; Suzuki, Tetsumi; and Uematsu, Takao, to Mitsubishi Kasei Kogyo Kabushiki Kaisha; a/k/a Mitsubishi Chemical Industries Limited. Process of polymerizing conjugated dienes and catalyst. 3,674,759, Cl. 260-82.100.

Yanagidaira, Hidetaka; Kawai, Kazuo; and Shintani, Sotokichi, to Kokusai Denshin Denwa Kabushiki Kaisha. Conversion system using a conversion table. 3,674,996, Cl. 235-154.000.

Yannopoulos, John C., to Newmont Exploration Limited. Continuous gas-atomized copper smelting and converting. 3,674,463, Cl. 75-72.000.

Yarovaya, Galina Dmitrievne: *See*—
Bokov, Jury Sergeevich; Vikulina, Ninel Vladimirovna; Dogadkin, Boris Aristarkhovich; Erofeev, Boris Vasilievich; Larina, Anastasia Vasilievna; Lavrischev, Vadim Petrovich; Markov, Vladimir Vladimirovich; Naumova, Sofia Fadeevna; Jurina, Olge Demidovna; and Yarovaya, Galina Dmitrievne, 3,674,496.

Yates, Charles B., to Circuit Foil Corporation. Bonding treatment and products produced thereby. 3,674,656, Cl. 204-13.000.

Yates, Kenneth, 50% to Allison, Donald B. Temporary support for electrical outlet box. 3,674,913, Cl. 174-48.000.

Yearout, James D.; and Tolbert, Richard E., to Process Services Inc. Gas lubricated bearing. 3,674,355, Cl. 308-122.000.

Yenisey, Osman Metin, to Bell Telephone Laboratories, Incorporated. Pulse circuit for controlling pulse. 3,675,048, Cl. 307-261.000.

Yochum, Daniel William; Haines, Paul Gordon; and Popoff, Ivan C., to Pennwalt Corporation. Accelerator composition. 3,674,701, Cl. 252-182.000.

Yokomizo, Takashi: *See*—
Komatsu, Youji,; Furukawa, Yauhiro; and Yokomizo, Takashi, 3,674,886.

Yokotsuka, Tamotsu; Hashimoto, Hikotaka; and Iwaasa, Takashi, to Kikkoman Shoyu Co., Ltd. Production of novel acidstable and thermostable protease. 3,674,644, Cl. 195-62.000.

Yoshida, Katuro: *See*—
Hozumi, Shiro; Hirai, Kenichi; Tanigawa, Yoshiyuki; Yoshida, Katuro; and Sugihara, Kanji, 3,673,666.

Yoshimura, Masao: *See*—

Tsuda, Motohisa; and Yoshimura, Masao, 3,675,027.
Yoshimura, Tatsushiro: *See*—
Izumo, Masanori; and Yoshimura, Tatsushiro, 3,674,762.
Yoshiyama, Masami; Sato, Teruo; and Takeda, Hitoshi, to Matsushita Electric Industrial Co., Ltd. Scanning apparatus for electroluminescent crossed-grid panel. 3,674,928, Cl. 178-7.30d.
Young, Bruce O.; Walker, Grant W.; Ford, Duane B.; and Seegmiller, Wan, to Energy Absorption Systems, Inc. Liquid shock absorbing buffer. 3,674,115, Cl. 188-1.00b.
Young, Charles Gilbert, to American Optical Corporation. Compensator for a radial refractive-index gradient in a disc laser. 3,675,152, Cl. 331-94.500.
Young, Herbert D.: *See*—
Whysong, Dale C.; Leininger, Dale E.; and Young, Herbert D., 3,674,559.
Youngstown Sheet and Tube Company: *See*—
Cullen, Roy H.; and Elliott, Charles H., 3,673,785.
Yperman, Jean Michel Baudry Ghislain; and Belhomme, Charles, to U.S. Philips Corporation. Electric ceramic resistors having positive temperature coefficients and method of manufacturing same. 3,674,713, Cl. 252-520.000.
Yu, Ruey J.: *See*—
Blank, Fritz; Day, William C.; Harmon, Sandra R.; Toncic, Pauline F.; and Yu, Ruey J., 3,674,645.
Zabel, Marvin L.: *See*—
Gage, Frank H.; and Zabel, Marvin L., 3,674,211.
Zablocki, Richard A.: *See*—
Scarnato, Thomas J.; Gordon, Paul C.; Hunter, Stephen R.; Krage, Paul W.; and Zablocki, Richard A., 3,673,779.
Zagel, Samuel J.; and Patton, Thomas H., to Compco Corporation. Room lighting installation. 3,675,006, Cl. 240-9.00r.
Zakharov, Valery Dmitrievich: *See*—
Fedorov, Svyatoslav Nikolaevich; and Zakharov, Valery Dmitrievich, 3,673,616.
Zakrzewski, Zdzislaw. Fluid motors. 3,673,924, Cl. 91-462.000.
Zaloudek, Theodore V.: *See*—
Garrett, Donald E.; and Zaloudek, Theodore V., 3,674,919.
Zankl, Frank, to Kearney & Trecker Corporation. Vibration dampener for a machine tool. 3,673,918, Cl. 90-11.00r.
Zankl, Frank; and Lohneis, Earl R., to Kearney & Trecker Corporation. Machine tool guide way restraint. 3,674,323, Cl. 308-3.00a.
Zaruba, Wenzel; and Sehnal, Jan, to Textol Systems, Inc. Reciprocating linear actuator. 3,673,874, Cl. 74-25.000.
Zaugg, Roland. Device for unidirectionally blocking a ratchet wheel in a clockwork movement. 3,673,791, Cl. 58-86.000.
Zavody Antonina Zapotockeho, narodni podnik: *See*—
Kralicek, Jaroslav; Kubanek, Vladimir; Solcova, Jitka; and Kondelikova, Jaroslava, 3,674,751.
Zeiss, Carl: *See*—
Butscher, Karlheinz, 3,675,238.
Zeiss, Carl,-Stiftung d.b.a., Carl Zeiss: *See*—
Weyrauch, Adolf, 3,674,372.
Zemba, John W.: *See*—
Dunbar, Joseph E.; and Zemba, John W., 3,674,795.
Zeneski, Edmund A., to Barden Corporation, The. Cage for angular contact ball bearing. 3,674,356, Cl. 308-187.000.
Zergenyi, Janos; and Habicht, Ernst, to Geigy Chemical Corporation. 4-Chloro-5-(2-methylene-butyryl)-benzo(b) thiopene-2-carboxylic acids. 3,674,810, Cl. 260-330.500.
Zimmerle, Donald F.: *See*—
Fischer, Robert E.; Raiff, Lawrence C.; Seybold, James M.; and Zimmerle, Donald F., 3,674,924.
Zimmermann, Volker, to Brown, Boveri & Cie. Method and apparatus for multiplying analog electrical quantities. 3,674,994, Cl. 235-150.520.
Zippe, Gunter: *See*—
Baumgartner, Siegfried; Fries, Bernd; Lidl, Rolf; and Zippe, Gunter, 3,674,408.
Zirkle, Charles L.: *See*—
Kaiser, Carl; and Zirkle, Charles L., 3,674,792.
Zoecon Corporation: *See*—
Siddall, John B., 3,674,663.
Zohar, Itzchak. Last for shoe production. 3,673,623, Cl. 12-133.00r.
Zouhar, Drahomir: *See*—
Havranek, Milan; Zouhar, Drahomir; Dusik, Josef; Kucera, Jaromir; and Krejcirik, Jiri, 3,673,818.
Zuev, Alfred Alexandrovich: *See*—
Voitsekhovsky, Bogdan Vyacheslavovich; Zuev, Alfred Alexandrovich; Plaxin, Vladimir Nikolaevich; and Makarov, Valery Nikolaevich, 3,673,849.
Zuk, Borys, to RCA Corporation. Transmission gate and biasing circuits. 3,675,144, Cl. 330-40.000.
Zykov, Vladimir Pavlovich; Panov, Alexei Alexandrovich; Prudnikov, Pavel Alexeevich; Khlopin, Mikhail Ivanovich; and Shlyapnikov, Alexel Dmitrievich. Electrolytic capacitor and a method of manufacturing the same. 3,675,087, Cl. 317-230.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 4TH DAY OF JULY, 1972

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

American Machine & Foundry Co.: *See*—
Walsh, Richard D. Re. 27,416.

Bell Telephone Laboratories, Inc.: *See*—
Schoeffler, Max S. Re. 27,422.

Brown & Root, Inc.: *See*—
Rochelle, William R., Lochridge, and Desai. Re. 27,420.

Desai, Ardeshir: *See*—
Rochelle, William R., Lochridge, and Desai. Re. 27,420.

Egawa, Susumu, to Matsushita Electric Industrial Co., Ltd. Dynamic convergence device for three electron gun color television receiver. Re. 27,417, 7–4–72, Cl. 315—13.

Ericson, John A.: *See*—
Nadrich, John. Re. 27,419.

Honeywell Inc.: *See*—
Owens, Wiley H. Re. 27,421.

Hulbert, Richard W.: *See*—
Nies, Nelson P., and Hulbert. Re. 27,424.

Lochridge, Joe C.: *See*—
Rochelle, William R., Lochridge, and Desai. Re. 27,420.

Matsushita Electric Industrial Co., Ltd.: *See*—
Egawa, Susumu. Re. 27,417.

Mayne, William H., to Petty Geophysical Engineering Co. Method and apparatus for improving seismic impact signals. Re. 27,418, 7–4–72, Cl. 181—.5.

Nadrich, John, and J. A. Ericson. Closure for a bottom pour metallurgical ladle. Re. 27,419, 7–4–72, Cl. 222—548.

Nies, Nelson P., and R. W. Hulbert, to United States Borax & Chemical Corp. Zinc borate of low hydration and method for preparing same. Re. 27,424, 7–4–72, Cl. 23—59.

Owens, Wiley H., to Honeywell Inc. Pyrotechnic means for interrupting the light output of a flash bulb. Re. 27,421, 7–4–72, Cl. 250—201.

Petty Geophysical Engineering Co.: *See*—
Mayne, William H. Re. 27,418.

Riester, William C., to Trico Products Corp. Windshield cleaning system for motor vehicles. Re. 27,423, 7–4–72, Cl. 318—443.

Rochelle, William R., J. C. Lochridge, and A. R. Desai, to Brown & Root, Inc. Marine apparatus for supporting flexible elongate pipe means during underwater laying thereof. Re. 27,420, 7–4–72, Cl. 61—72.3.

Schoeffler, Max S., to Bell Telephone Laboratories, Inc. Automatic recall switching system. Re. 27,422, 7–4–72, Cl. 179—18.

Trico Products Corp.: *See*—
Riester, William C. Re. 27,423.

Walsh, Richard D., to American Machine & Foundry Co. Control mechanism for bowling pin spotting machine. Re. 27,416, 7–4–72, Cl. 273—43.

United States Borax & Chemical Corp.: *See*—
Nies, Nelson P., and Hulbert. Re. 27,424.

LIST OF PLANT PATENTEES

Howard Rose Co.: *See*—
McGredy, Samuel D. 3,226.

Jackson & Perkins Co.: *See*—
Kordes, Reimer. 3,228.
Kordes, Reimer 3,229.
Lens, Louis. 3,227.

Kordes, Reimer, to Jackson & Perkins Co. Rose plant. 3,228, 7–4–72, Cl. 15.

Kordes, Reimer, to Jackson & Perkins Co. Rose plant. 3,229, 7–4–72, Cl. 22.

Lens, Louis, to Jackson & Perkins Co. Rose plant. 3,227, 7–4–72, Cl. 20.

McGredy, Samuel D., to Howard Rose Co. Rose plant. 3,226, 7–4–72, Cl. 11.

Merrill, Grant. Peach tree. 3,230, 7–4–72, Cl. 43.

Pan-American Plant Co.: *See*—
Shoesmith, Leonard H. 3,224.
Shoesmith, Leonard H. 3,225.

Shoesmith, Leonard H., to Pan-American Plant Co. Chrysanthemum plant (Hostess). 3,224, 7–4–72, Cl. 76.

Shoesmith, Leonard H., to Pan-American Plant Co. Chrysanthemum plant (Copperplate). 3,225, 7–4–72, Cl. 79.

LIST OF DESIGN PATENTEES

Abbott Laboratories: *See*—
Swartzbaugh, Peter. 224,091.

Accurist S.A.: *See*—
Musy, Raymond. 224,131.

Acree, Julian J. Refuse can stand. 224,144, 7–4–72, Cl. D49—30.

Advance Metal Products, Inc.: *See*—
Kalendar, Herbert. 224,115.

Ammons, Jimmy W. Camper. 224,098, 7–4–72, Cl. D14—3.

Annichini, Luciano. Table lamp. 224,139, 7–4–72, Cl. D48—20.

Anzai, Shiro, M. Murata, T. Nishikawa, and T. Hanakata, to Canon Kabushiki Kaisha. Calculator tape cartridge. 224,116, 7–4–72, Cl. D26—14.

Ar-Ka-Mo Sporting Goods, Inc.: *See*—
Tremel, Raymond F., and Christian. 224,122.

Asahi Engineering Co., Ltd.: *See*—
Matsumoto, Rikio. 224,087.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Goto, Kazuo. 224,164.

Bach, Walter H. Motion picture camera housing. 224,162, 7–4–72, Cl. D61—1.

Baierl, Martha L. H. Ski doll. 224,121, 7–4–72, Cl. D34—4.

Baranowski, Frank, Jr. Pressure regulator. 224,106, 7–4–72, Cl. D23—21.

Bell Telephone Laboratories, Inc.: *See*—
Genaro, Donald M., Kelly, McGarvey, and Stokes. 224,117.

Berg Mfg. Co., The: *See*—
Mastis, Victor. 224,107.

Berkey/Colortran Mfg., Inc.: *See*—
Hartz, George R. 224,118.

Bio/Data Corp.: *See*—
Raczak, Earl F. 224,102.

Blankenship, Arthur C., to Uniroyal, Inc. Pneumatic tire. 224,180, 7–4–72, Cl. D90—20.

Bloch, Jack, to Foster Grant Co., Inc. Pair of spectacles. 224,160, 7–4–72, Cl. D57—1.

Boganowski, Theodore D. Ski scooter. 224,125, 7–4–72, Cl. D34—15.

Briggs & Stratton Corp.: *See*—
Gordon, Douglas. 224,170.

Brown, William L., to Littelfuse, Inc. Fuse panel. 224,113, 7–4–72, Cl. D26—13.

Bryant, Helen H. Knapsack. 224,178, 7–4–72, Cl. D87—1.

Burandt, Corliss O., to Thexton Mfg. Co. Connector socket. 224,109, 7–4–72, Cl. D26—1.

Cadiou, Jean, to Societe Anonyme Automobiles Citroen. Automobile. 224,097, 7–4–72, Cl. D14—3.

Canon Kabushiki Kaisha: *See*—
Anzai, Shiro, Murata, Nishikawa, and Hanakata. 224,116.

Christian, Thomas C.: *See*—
Tremel, Raymond F., and Christian. 224,122.

Clement, Carl J., to Pholophysics, Inc. Combined data terminal and hard copy printer. 224,112, 7–4–72, Cl. D26—5.

Cleminshaw, Douglas R., and R. G. Wells, to R. E. Dietz Co. Vehicle auxiliary lamp. 224,143, 7–4–72, Cl. D48—32.

Clifford, Arthur J. Tongue depressor. 224,173, 7–4–72, Cl. D83—12.

Corning Glass Works: *See*—
Mirow, Gregory. 224,136.

Cuva, Angelo C. Light socket holder. 224,085, 7–4–72, Cl. D8—259.

Cyr, Steve, and M. Whelan, to Standard Oil Co. Compartmented cover for a tray. 224,090, 7–4–72, Cl. D9—254.

Dart Industries, Inc.: *See*—
Swett, James B. 224,133.

Dietz, R. E., Co.: *See*—
Knapp, George A. 224,142.
Cleminshaw, Douglas R., and Wells. 224,143.

Dioptrix, Inc.: *See*—
Simpson, Lewis E. 224,166.

Doman, Donald W., to Kohler Co. Water closet. 224,108, 7–4–72, Cl. D23—65.

Duvall, Leroy F., and C. D. Stone, to The Quaker Oats Co. Expanded cereal food product. 224,077, 7–4–72, Cl. D1—1.

Eastman Kodak Co.: *See*—
Laughon, Thomas C. 224,165.

Electrohome Ltd.: *See*—
Griffin, Donald S. 224,159.
McQuarrie, Harvey K. 224,161.

Elixir Industries: *See*—
Sahm, Roland R. 224,149.
Sahm, Roland R. 224,150.

Foster Grant Co., Inc.: *See*—
Bloch, Jack. 224,160.

Frank, Randolph L. Inflatable sled. 224,127, 7–4–72, Cl. D34—15.

Fukda, Masahiro : *See*—
Mizukawa, Shigeo, and Fukda. 224,163.
Gaffney, James F. Gun support. 224,084, 7–4–72, Cl. D8—235.
Gaskins, Robert J. Combined mud flap support and tail light holder for trucks. 224,099, 7–4–72, Cl. D14—6.
Genaro, Donald M., T. J. Kelly, J. N. McGarvey, and R. R. Stokes, to Bell Telephone Laboratories, Inc. Videotelephone transceiver. 224,117, 7–4–72, Cl. D26—14.
Gilbert, Clifford W. Guitar. 224,154, 7–4–72, Cl. D56—901.
Glass, Marvin, & Associates : *See*—
Morrison, Howard J., and Glass. 224,124.
Glass, Marvin I. : *See*—
Morrison, Howard J., and Glass. 224,124.
Gordon, Douglas, to Briggs & Stratton Corp. Muffler. 224,170, 7–4–72, Cl. D77—1.
Goto, Kazuo, to Asahi Kogaku Kogyo Kabushiki Kaisha. Camera focussing handle. 224,164, 7–4–72, Cl. D61—1.
Griese, Elmer W., Jr., to National Can Corp. Carrying handle for a container or the like. 224,093, 7–4–72, Cl. D9—291.
Griffin, Donald S., to Electrohome Ltd. Television receiver. 224,159, 7–4–72, Cl. D56—4.
Hadlow, David M., to The Stanley Works, Drapery rod. 224,081, 7–4–72, Cl. D8—208.
Haeger Potteries, Inc., The : *See*—
Kaelke, Edwin K. 224,120.
Hanakata, Takamitsu : *See*—
Anzai, Shiro, Murata, Nishikawa, and Hanakata. 224,116.
Hancock, Glen C., and W. T. Young, to Shoney's South, Inc. Food bar. 224,171, 7–4–72, Cl. D80—2.
Harman-Kardon, Inc. : *See*—
Yurdin, Carl. 224,157.
Yurdin, Carl. 224,158.
Hartz, George R., to Berkey/Colortran Mfg., Inc. Combined battery pack and charger unit. 224,118, 7–4–72, Cl. D26—15.
Healthwear Underwear, Inc. : *See*—
Wise, Daniel. 224,078.
Hedstrom Co. : *See*—
Voytko, Charles L. 224,079.
Heimann, Richard F. Data display console. 224,110, 7–4–72, Cl. D26—5.
Hitachi Ltd. : *See*—
Matsumoto, Rikio. 224,087.
Holden, William R. Cigarette holder or similar article. 224,174, 7–4–72, Cl. D85—8.
Hooker, Russell H. Holder for pens and pictures. 224,168, 7–4–72, Cl. D74—5.
Huley, Peter. Tricycle. 224,126, 7–4–72, Cl. D34—15.
Hunter, George L. L. Radio cabinet. 224,156, 7–4–72, Cl. D56—4.
Huthsing, Charles K., Jr., deceased, by N. Evelyn Huthsing, executor. Bottle or similar article. 224,088, 7–4–72, Cl. D9—40.
Huthsing, N. Evelyn : *See*—
Huthsing, Charles K., Jr. 224,088.
Janome Sewing Machine Co., Ltd. : *See*—
Yamamoto, Yasuaki. 224,132.
Kaelke, Edwin K., to The Haeger Potteries, Inc. Floral vase or the like. 224,120, 7–4–72, Cl. D29—28.
Kalendar, Herbert, to Advance Metal Products, Inc. Control station for penumatic tube system. 224,115, 7–4–72, Cl. D26—13.
Kelly, Thomas J. : *See*—
Genaro, Donald M., Kelly, McGarvey, and Stokes. 224,117.
Kelley, James O. : *See*—
Propst, Robert L., and Kelley. 224,096.
Kidde, Walter, & Co., Inc. : *See*—
Sterner, Russell L. 224,128.
Sterner, Russell L. 224,129.
Knapp, George A., to R. E. Dietz Co. Vehicle marker light lens. 224,142, 7–4–72, Cl. D48—32.
Kohler Co. : *See*—
Doman, Donald W. 224,108.
Kostee, Frank, Sr. Tie-down device. 224,082, 7–4–72, Cl. D8—229.
Lapeyre, James M. Insert roll hold down. 224,151, 7–4–72, Cl. D55—1.
Lapeyre, James M., Insert roll hold down. 224,152, 7–4–72, Cl. D55—1.
Lapeyre, James M. Insert roll hold down. 224,153, 7–4–72, Cl. D55—1.
Larson, Ellis D. Component for railings, grill works, columns and the like. 224,095, 7–4–72, Cl. D13—1.
Laughon, Thomas C., to Eastman Kodak Co. Design for photofinishing console. 224,165, 7–4–72, Cl. D61—1.
Lawson, Bruce F. Pulling tool or similar article. 224,080, 7–4–72, Cl. D8—14.
Lee, Hue R. Multiple dwelling structure. 224,094, 7–4–72, Cl. D13—1.
Littelfuse, Inc. : *See*—
Brown, William L. 224,113.
Lohmann, Larry J. : *See*—
Mansur, Fred E., Lohmann, Wojcik, and Martel. 224,111.
Mahler, Kenneth. Mat. 224,138, 7–4–72, Cl. D44—31.
Mansur, Fred E., L. J. Lohmann, G. E. Wojcik, and R. A. Martel, to Owens-Illinois, Inc. Multiple gas discharge display device. 224,111, 7–4–72, Cl. D26—5.
Mark, Rebecca. Cosmetic vanity tray. 224,175, 7–4–72, Cl. D86—10.
Martel, Richard A. : *See*—
Mansur, Fred E., Lohmann, Wojcik, and Martel. 224,111.
Mastis, Victor, to The Berg Mfg. Co. Gladhand connector. 224,107, 7–4–72, Cl. D23—44.
Matsumoto, Rikio, to Asahi Engineering Co., Ltd., Sonyo Kako Co., Ltd., and Hitachi Ltd. Combined bottle and ice tray. 224,087, 7–4–72, Cl. D9—10.
McGarvey, John N. : *See*—
Genaro, Donald M., Kelly, McGarvey, and Stokes. 224,117.
McQuarrie, Harvey K., to Electrohome Ltd. Housing for a combined radio receiver and record player or similar article. 224,161, 7–4–72, Cl. D56—4.
Mead Johnson and Co. : *See*—
Wiethop, Robert R. 224,103.
Milan, Nicholas M. Height gauge. 224,146, 7–4–72, Cl. D52—6.
Miller, Herman, Inc. : *See*—
Propst, Robert L., and Kelley. 224,096.
Miller, M. Louis. Victory Engineering Corp. Digital thermometer. 224,147, 7–4–72, Cl. D52—7.
Mirow, Gregory, to Corning Glass Works. Plate or the like. 224,136, 7–4–72, Cl. D44—15.
Mizukawa, Shigeo, and M. Fukda. Motion picture camera. 224,163, 7–4–72, Cl. D61—1.
Mora, Robert T. Steering wheel rim. 224,100, 7–4–72, Cl. D14—30.
Morrison, Howard J., and M. I. Glass, to Marvin Glass & Associates. Child's riding vehicle. 224,124, 7–4–72, Cl. D34—15.
Mueller, Edward G., to George Risk Industries, Inc. Pushbutton switch. 224,114, 7–4–72, Cl. D26—13.
Murata, Minoru : *See*—
Anzai, Shiro, Murata, Nishikawa, and Hanakata. 224,116.
Musy, Raymond, to Accurist S.A. Case for a pendant watch. 224,131, 7–4–72, Cl. D42—8.
National Can Corp. : *See*—
Griese, Elmer W., Jr. 224,093.
Nishikawa, Tatsuo : *See*—
Anzai, Shiro, Murata, Nishikawa, and Hanakata. 224,116.
Owens-Illinois, Inc. : *See*—
Mansur, Fred E., Lohmann, Wojcik, and Martel. 224,111.
Pholophysics, Inc. : *See*—
Clement, Carl J. 224,112.
Pope, William K., to Uniroyal, Inc. Pneumatic tire. 224,181, 7–4–72, Cl. D90—20.
Proctor, Douglas Ben I. Sail boat hull. 224,167, 7–4–72, Cl. D71—1.
Propst, Robert L., and J. O. Kelley, to Herman Miller Inc. Cart. 224,096, 7–4–72, Cl. D14—3.
Purer, Phillip, to Victory-Puretec, Inc. Lamp. 224,140, 7–4–72, Cl. D48—20.
Quaker Oats Co., The : *See*—
Duvall, Leroy F., and Stone. 224,077.
Raczak, Earl F., to Bio/Data Corp. Automatic pipette. 224,102, 7–4–72, Cl. D16—2.
RDW Industries, Inc. : *See*—
Steidley, Roy B. 224,092.
Richter, Roy E. Wheel. 224,101, 7–4–72, Cl. D14—30.
Risk, George, Industries, Inc. : *See*—
Mueller, Edward G. 224,114.
Rubery, Owen & Co. Ltd. : *See*—
Rudd, Anthony C. 224,169.
Rudd, Anthony C., to Rubery, Owen & Co. Ltd. Internal combustion engine. 224,169, 7–4–72, Cl. D77—1.
Sahm, Roland R., to Elixir Industries. Architectural panel. 224,149, 7–4–72, Cl. D54—2.
Sahm, Roland R., to Elixir Industries. Architectural panel. 224,150, 7–4–72, Cl. D54—2.
Salsgiver, James C. : *See*—
Walter, Russell A., and Salsgiver. 224,148.
Sartell, Donald L. Twirling baton. 224,123, 7–4–72, Cl. D34—5.
Schmidt, Clarence E. Dialyzing unit. 224,172, 7–4–72, Cl. D83—1.
Scire, William M. Hockey souvenir. 224,119, 7–4–72, Cl. D29—28.
Sexton, Edward to The Third Eye, Inc. Lamp. 224,141, 7–4–72, Cl. D48—20.
Shoney's South, Inc. : *See*—
Hancock, Glen C., and Young. 224,171.
Simpson Co. : *See*—
Tyrell, Gilb T. 224,083.
Simpson, Charles H. Canister. 224,134, 7–4–72, Cl. D44—6.
Simpson, Lewis E., to Dioptrix, Inc. Microfiche viewer. 224,166, 7–4–72, Cl. D61—1.
Smith, Donald K. Fishing lure. 224,104, 7–4–72, Cl. D22—28.
Smith, Ralph G. Guitar body or similar article. 224,155, 7–4–72, Cl. D56—1.
Societe Anonyme Automobiles Citroen : *See*—
Cadiou, Jean. 224,097.
Sonyo Kako Co., Ltd. : *See*—
Matsumoto, Rikio. 224,087.
Spencer, Vivian S. Cosmetic mirror. 224,176, 7–4–72, Cl. D86—10.
Standard Oil Co. : *See*—
Cyr, Steve, and Whelan. 224,090.
Stanley Works, The : *See*—
Hadlow, David M. 224,081.
Steffen, Vincent B. Milk carton holder. 224,137, 7–4–72, Cl. D44—21.
Steidley, Roy B., to RDW Industries, Inc. Dispensing closure. 224,092. 7–4–72, Cl. D9—258.
Sterner, Russell L., to Walter Kidde & Co., Inc. Boom section for a telescopic crane boom. 224,128, 7–4–72, Cl. D41—1.
Sterner, Russell L., to Walter Kidde & Co., Inc. Telescopic crane boom. 224,129, 7–4–72, Cl. D41—1.
Stokes, Rembert R. : *See*—
Genaro, Donald M., Kelly, McGarvey, and Stokes. 224,117.
Stone, Charles D. : *See*—
Duvall, Leroy F., and Stone. 224,077.
Swanson, Keith N. Photographic timer. 224,130, 7–4–72, Cl. D42—7.
Swartzbaugh, Peter, to Abbott Laboratories. Dispensing top for a container. 224,091, 7–4–72, Cl. D9—257.
Swett, James B., to Dart Industries, Inc. Sink pad holder. 224,133. 7–4–72, Cl. D44—1.
Takeuchi, Kazutaka, to Tomy Kogyo Co., Ltd. Toy trackway. 224,089, 7–4–72, Cl. D34—015.

Taylor, George F. Sheller for peas or the like. 224,179, 7–4–72, Cl. D89—91.
Thexton Mfg. Co.: *See*—
Burandt, Corliss O. 224,109.
Third Eye, Inc., The: *See*—
Sexton, Edward. 224,141.
Tomy Kogyo Co., Ltd.: *See*—
Takeuchi, Kazutaka. 224,089.
Tremel, Raymond F., and T. C. Christian, to Ar-Ka-Mo Sporting Goods, Inc. Game board. 224,122, 7–4–72, Cl. D34—5.
Turturro, Michael A. Water filter or similar article. 224,105, 7–4–72, Cl. D23—4.
Tyrell, Glib T., to Simpson Co. Holddown for anchoring wall studs in frame construction to building foundations. 224,083, 7–4–72, Cl. D8—233.
Uniroyal, Inc.: *See*—
Blankenship Arthur C. 224,180.
Pope, William K. 224,181.
Ussery, Cecil F., to Ussery Industries, Inc. Vending machine. 224,145, 7–4–72, Cl. D52—3.
Ussery Industries, Inc.: *See*—
Ussery, Cecil F. 224,145.
Victory Engineering Corp.: *See*—
Miller, M. Louis. 224,147.
Victory-Puretec, Inc.: *See*—
Purer, Phillip. 224,140.
Voytko, Charles L., to Hedstrom Co. High chair. 224,079, 7–4–72, Cl. D6—8.
Wallace, Robert S. Tape cassette box. 224,177, 7–4–72, Cl. D87—1.
Walter, Russell A., and J. C. Salsgiver. Thermometer. 224,148, 7–4–72, Cl. D52—7.
Watts Mfg. Co.: *See*—
Woodruff, Melvin. 224,135.
Wells, Robert G.: *See*—
Cleminshaw, Douglas R., and Wells. 224,143.
Whelan, Mark: *See*—
Cyr, Steve, and Whelan. 224,090.
Wiethop, Robert R., to Mead Johnson and Co. Vitamin tablet or similar article. 224,103, 7–4–72, Cl. D16—3.
Willis, Sheldon. Pin. 224,086, 7–4–72, Cl. D8—266.
Wise, Daniel, Healthwear Underwear, Inc. Purse for attachment to a bra. 224,078, 7–4–72, Cl. D2—400.
Wojcik, Gerald E.: *See*—
Mansur, Fred E., Lohmann, Wojcik, and Martel. 224,111.
Woodruff, Melvin, to Watts Mfg. Co. Covered bowl. 224,135, 7–4–72, Cl. D44—15.
Yamamoto, Yasuaki, to Janome Sewing Machine Co., Ltd. Food mixer. 224,132, 7–4–72, Cl. D44—1.
Young, W. Terry: *See*—
Hancock, Glen C., and Young. 224,171.
Yurdin, Carl, to Harman-Kardon, Inc. Combined radio-phonograph and tape player or similar article. 224,157, 7–4–72, Cl. D56—4.
Yurdin, Carl, to Harman-Kardon, Inc. Phonograph. 224,158, 7–4–72, Cl. D56—4.

CLASSIFICATION OF PATENTS

ISSUED JULY 4, 1972

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

3R	3,673,609
14V	3,673,610
192	3,673,611

CLASS 3

1	3,673,612
4	3,673,615
13	3,673,616
27	3,673,613

CLASS 4

10	3,673,614
187	3,673,617

CLASS 5

63	3,673,620
164	3,673,618
260	3,673,619

CLASS 7

8	3,673,621

CLASS 8

11	3,674,414
94.21	3,674,415
115.5	3,674,417
116.3	3,674,416
	3,674,418
158	3,674,419
173	3,674,420

CLASS 9

1T	3,673,622

CLASS 12

133R	3,673,623

CLASS 13

9	3,674,903
20	3,674,904

CLASS 14

19	3,673,624

CLASS 15

42	3,673,625
97R	3,673,626
104.06R	3,673,629
104.3SN	3,673,627
143A	3,673,628
160	3,673,630
250.42	3,673,631
316	3,673,632

CLASS 16

16	3,673,633
126	3,673,634
163	3,673,635
175	3,673,636

CLASS 17

11.1	3,673,637

CLASS 21

74R	3,674,421
102R	3,674,422

CLASS 23

2E	3,674,423
15W	3,674,424
59	Re.27,424
113	3,674,425
	3,674,426
119	3,674,427
134	3,674,428
159	3,674,429
182V	3,674,430
205	3,674,431
	3,674,432
209.4	3,674,433
230R	3,674,434
232E	3,674,436
232R	3,674,435
252R	3,674,437
253R	3,674,438
254R	3,674,439
258.5	3,674,440
288F	3,674,441
299	3,674,442

CLASS 24

16PB	3,673,639
19	3,673,638
30.5R	3,673,640
67.9	3,673,641
68D	3,673,642
73B	3,673,643
122.6	3,673,644
203	3,673,645
230.5CR	3,673,646

CLASS 26

54	3,673,647

CLASS 28

1.4	3,673,648
1.7	3,673,649
72.1	3,673,650

CLASS 29

6	3,673,651
25.16	3,673,652
96	3,673,653
97	3,673,654
105A	3,673,656
105	3,673,655
	3,673,657
155R	3,673,658
156.8CF	3,673,659
159.2	3,673,660
182.8	3,674,443
186	3,674,444
195	3,674,445
	3,674,446
196.6	3,674,447
197.5	3,674,448
200A	3,673,663
200B	3,673,662
201	3,673,661
203DT	3,673,666
203D	3,673,665
203P	3,673,664
254	3,673,668
423	3,673,667
428	3,673,669
432.2	3,673,670
	3,673,671
443	3,673,672
451	3,673,673
464	3,673,674
469	3,673,675
473.1	3,673,676
	3,673,677
494	3,673,678
571	3,673,679
626	3,673,680
	3,673,681

CLASS 30

4R	3,673,682
34.1	3,673,683
34.2	3,673,684
142	3,673,685
168	3,673,686
294	3,673,687

CLASS 32

22	3,673,709

CLASS 33

1	3,673,688
75R	3,673,689
75	3,673,690
76	3,673,691
118	3,673,692
141R	3,673,693
174L	3,673,695
185R	3,673,694
348	3,673,696
	3,673,697

CLASS 34

5	3,673,698
66	3,673,699
89	3,673,700
90	3,673,701
162	3,673,702
225	3,673,703

CLASS 35

8	3,673,704
19A	3,673,706
19R	3,673,705
35D	3,673,707
35G	3,674,905
37	3,673,708
44	3,673,710
48R	3,674,906
62	3,673,711
74	3,673,712

CLASS 36

2.5AB	3,673,713
81	3,673,714

CLASS 37

43E	3,673,715
61	3,673,716

CLASS 40

2	3,673,717
5	3,673,718
20R	3,673,719
104.07	3,673,721
125R	3,673,720
152	3,673,722
	3,673,724
152.1	3,673,723

CLASS 42

1R	3,673,725

CLASS 43

42.11	3,673,726
42.5	3,673,727
42.51	3,673,728
43.11	3,673,729
137	3,673,730

CLASS 44

10R	3,674,449
66	3,674,450

CLASS 46

47	3,673,731
74D	3,673,732

CLASS 47

58	3,673,733

CLASS 49

35	3,673,734
70	3,673,735
235	3,673,736

CLASS 51

38	3,673,737
73R	3,673,739
93	3,673,738
95WH	3,673,740
101R	3,673,742
127	3,674,451
134.5R	3,673,741
168	3,673,743
177	3,673,744
215HM	3,673,745
283	3,673,746
370	3,673,747

CLASS 52

60	3,673,748
73	3,673,749
169	3,673,750
	3,673,751
187	3,673,752
685	3,673,753
747	3,673,754
749	3,673,755

CLASS 53

21FW	3,673,757
22A	3,673,760
22B	3,673,758
29	3,673,759
42	3,673,761
61	3,673,756
86	3,673,762
183	3,673,763
187	3,673,765
335	3,673,766
374	3,673,764
385	3,67 3,767

CLASS 55

135	3,673,768
223	3,673,769
234	3,673,770
306	3,673,771

CLASS 56

13.1	3,673,772
13.3	3,673,773
13.9	3,673,774
14.7	3,673,775
16.9	3,673,776
17.5	3,673,777
320.2	3,673,778
503	3,673,779

CLASS 57

34R	3,673,780
58.89	3,673,781
77.45	3,673,782
135	3,673,783
156	3,673,784
161	3,673,785

CLASS 58

28A	3,673,786
50R	3,673,787
58	3,673,788
	3,673,789
63	3,673,790
86	3,673,791
116	3,673,792
152R	3,673,793

CLASS 59

35	3,673,794
80	3,673,795

CLASS 60

13	3,673,796
	3,673,797
	3,673,798
54	3,673,799
54.5HA	3,673,800
218	3,673,801
226R	3,673,803
226	3,673,802

CLASS 61

1F	3,673,804
5	3,673,805
35	3,673,807
45R	3,673,806
72.3	Re.27,420
72.4	3,673,808

CLASS 62

6	3,673,809
158	3,673,810
	3,673,811
404	3,673,812

CLASS 63

12	3,673,815

CLASS 64

1V	3,673,813
8	3,673,814
23	3,673,816
23.7	3,673,817

CLASS 65

4	3,674,452
30	3,674,453
	3,674,454
134	3,674,455
182R	3,674,456

CLASS 66

57	3,673,818
126R	3,673,819
177	3,673,820
	3,673,821

CLASS 68

5	3,673,822
12R	3,673,823
	3,673,824
20	3,673,825
176	3,673,826
222	3,673,827

CLASS 70

58	3,673,828
252	3,673,829
352	3,673,830
373	3,673,831

CLASS 71

67	3,674,457
77	3,674,458
118	3,674,459
121	3,674,460

CLASS 72

35	3,673,832
56	3,673,833
57	3,673,834
	3,673,835
78	3,673,836
102	3,673,837
187	3,673,838
196	3,673,839
208	3,673,840
245	3,673,843
248	3,673,841
293	3,673,842
298	3,673,844
318	3,673,845
326	3,673,846
405	3,673,847
410	3,673,848
448	3,673,849

CLASS 73

1R	3,673,850
3	3,673,851
15.4	3,673,852
19	3,673,853
23	3,673,854
37.5	3,673,856
40	3,673,855
40.5A	3,673,857
40.5R	3,673,858
67.8R	3,673,859
67.9	3,673,860
101	3,673,861
102	3,673,862
114	3,673,863
153	3,673,864
159	3,673,865
212	3,673,866
337	3,673,867
343R	3,673,868
	3,673,869
349	3,673,870
421R	3,673,871
505	3,673,872
517	3,673,873

CLASS 74

5.43	3,673,875
25	3,673,874
37	3,673,876
	3,673,877
125.5	3,673,878
	3,673,879
197	3,673,880
198	3,673,881
199	3,673,882
233	3,673,883
242.11S	3,673,884
421R	3,673,885
424.8R	3,673,886
568R	3,673,887
607	3,673,888
681	3,673,890
713	3,673,889
804	3,673,891
870	3,673,892

CLASS 75

.5R	3,674,461
9	3,674,462
72	3,674,463
101R	3,674,464
108	3,674,465
109	3,674,466
124	3,674,469
126R	3,674,467
128A	3,674,468
134V	3,674,470
153	3,674,471
221	3,674,472

CLASS 76

111	3,673,893

CLASS 81

9.51	3,673,894
90A	3,673,895
165	3,673,896

CLASS 82

1C	3,673,897
2.5	3,673,898

CLASS 83

4	3,673,899
11	3,673,900
14	3,673,901
133	3,673,902
168	3,673,903
171	3,673,904
175	3,673,905
208	3,673,906
674	3,673,907
685	3,673,908

CLASS 84

1.01	3,674,907
212	3,674,908
312	3,674,909
377	3,674,910
403	3,673,909
411	3,674,911

CLASS 85

3R	3,673,910
5N	3,673,914
36	3,673,911
45	3,673,912
70	3,673,913

CLASS 87

12	3,673,915

CLASS 89

1.816	3,673,916
7	3,673,917

CLASS 90

11R	3,673,918
11.62	3,673,919
58B	3,673,920

CLASS 91

299	3,673,921
309	3,673,923
422	3,673,922
462	3,673,924

CLASS 92

51	3,673,926
98	3,673,927
128	3,673,925

CLASS 93

36.3	3,673,928
58.2R	3,673,929

CLASS 94

45A	3,673,931
45R	3,673,930

CLASS 95

1.1	3,673,932
	3,673,933
11R	3,673,935
11	3,673,934
12	3,673,936
	3,673,937
13	3,673,938
	3,673,939
	3,673,940
24	3,673,943
31AC	3,673,941
57	3,673,942
89R	3,673,944

CLASS 96

1.3	3,674,475
1.5	3,674,473
	3,674,474
1.8	3,674,476
	3,674,477
3	3,674,478
27	3,674,479
29	3,674,480
	3,674,481
	3,674,482
33	3,674,483
34	3,674,484
35	3,674,485
35.1	3,674,486
41	3,674,487
44	3,674,488
48R	3,674,490
48	3,674,489
66.3	3,674,491
68	3,674,492
72	3,674,493
86P	3,674,494
91N	3,674,496
91R	3,674,495
94	3,674,497
119	3,674,498
123	3,674,499

CLASS 98

40D	3,673,945
	3,673,946

CLASS 99

2R	3,674,509
17	3,674,500
	3,674,501
28	3,674,502
100	3,674,503
107	3,674,504
108	3,674,505

109	3,674,506
136	3,674,507
140R	3,674,508
154	3,674,510
176	3,674,511
178	3,674,512
217	3,674,513
237R	3,674,514
278	3,673,947
355	3,673,948
443	3,673,949
CLASS 100	
7	3,673,950
38	3,673,951
98	3,673,952
CLASS 101	
19	3,673,953
40	3,673,954
93C	3,673,955
	3,673,956
	3,673,957
122	3,673,958
148	3,673,959
269	3,673,960
465	3,673,961
467	3,673,962
CLASS 102	
38	3,673,963
39	3,673,964
95	3,673,965
CLASS 104	
1R	3,673,966
88	3,673,967
CLASS 105	
369BA	3,673,968
369A	3,673,969
CLASS 106	
1	3,674,515
	3,674,516
	3,674,517
38.27	3,674,518
46	3,674,519
47Q	3,674,530
54	3,674,520
72	3,674,521
90	3,674,522
168	3,674,523
243	3,674,524
286	3,674,526
287SC	3,674,525
289	3,674,527
300	3,674,528
306	3,674,529
CLASS 111	
85	3,673,970
CLASS 112	
158R	3,673,971
258	3,673,972
CLASS 114	
.5D	3,673,973
	3,673,974
43.5	3,673,975
61	3,673,976
144	3,673,977
CLASS 115	
35	3,673,978
CLASS 116	
129	3,673,979
CLASS 117	
7	3,674,531
17.5	3,674,532
27	3,674,533
34	3,674,534
36.7	3,674,538
36.8	3,674,535
47A	3,674,536
49	3,674,537
56	3,674,539
	3,674,540
62	3,674,541
72	3,674,542
93	3,674,543
93.1PF	3,674,544
93.31	3,674,545
94	3,674,546
135.5	3,674,547
139.5A	3,674,548
201	3,674,549
212	3,674,550
	3,674,551
217	3,674,552
	3,674,553
237	3,674,554
CLASS 118	
6	3,673,980
	3,673,981
48	3,673,983
416	3,673,984
637	3,673,985
641	3,673,982
CLASS 119	
2	3,673,986
19	3,673,987
CLASS 122	
7R	3,673,988
CLASS 123	
32EA	3,673,989
52R	3,673,990
58A	3,673,991
118	3,673,992
119A	3,673,993
119B	3,673,994
122D	3,673,995
136	3,673,997
139AP	3,673,996
148E	3,673,998
149H	3,673,999
193CH	3,674,000
CLASS 124	
24	3,674,001
30R	3,674,002
CLASS 125	
11H	3,674,003
16R	3,674,004
CLASS 126	
91A	3,674,005
CLASS 127	
29	3,674,555
62	3,674,556
	3,674,557
CLASS 128	
1.2	3,674,006
2A	3,674,008
	3,674,009
2F	3,674,011
2R	3,674,010
2	3,674,007
2.05D	3,674,013
2.05R	3,674,014
2.06F	3,674,015
2.1R	3,674,012
4	3,674,016
25R	3,674,017
33	3,674,018
	3,674,019
66	3,674,020
90	3,674,021
142	3,674,022
166	3,674,023
234	3,674,024
263	3,674,025
	3,674,026
268	3,674,027
272	3,674,028
285	3,674,029
	3,674,030
303.1	3,674,031
346	3,674,032
350R	3,674,033
379	3,674,034
CLASS 130	
10	3,674,035
CLASS 131	
7	3,674,036
198A	3,674,037
CLASS 132	
7	3,674,038
82	3,674,039
CLASS 134	
2	3,674,558
9	3,674,559
58R	3,674,040
CLASS 136	
23	3,674,560
29	3,674,561
83R	3,674,562
86A	3,674,563
100R	3,674,564
111	3,674,565
114	3,674,566
164	3,674,567
205	3,674,568
CLASS 137	
1	3,674,041
	3,674,042
12	3,674,043
81.5	3,674,044
	3,674,045
101	3,674,047
270	3,674,048
355.2	3,674,049
384.2	3,674,046
536	3,674,050
614.04	3,674,051
625.21	3,674,052
CLASS 138	
30	3,674,053
	3,674,054
89	3,674,055
134	3,674,056
CLASS 139	
122R	3,674,057
124A	3,674,058
CLASS 141	
4	3,674,059
83	3,674,060
198	3,674,061
387	3,674,062
CLASS 142	
1	3,674,063
CLASS 143	
46R	3,674,064
160R	3,674,065
CLASS 144	
34E	3,674,066
288A	3,674,067
309L	3,674,068
326R	3,674,069
CLASS 145	
50A	3,674,070
CLASS 146	
130	3,674,071
CLASS 148	
11.5A	3,674,569
12	3,674,570
31.5	3,674,571
	3,674,572
	3,674,573
	3,674,574
32.5	3,674,575
35	3,674,576
143	3,674,577
CLASS 149	
2	3,674,578
CLASS 150	
1.5R	3,674,072
7	3,674,073
52R	3,674,074
CLASS 151	
21B	3,674,075
CLASS 152	
209R	3,674,076
209	3,674,077
330	3,674,078
361	3,674,079
375	3,674,080
CLASS 156	
5	3,674,579
13	3,674,580
84	3,674,581
133	3,674,582
166	3,674,600
167	3,674,583
173	3,674,584
182	3,674,585
196	3,674,586
230	3,674,588
245	3,674,587
	3,674,589
252	3,674,590
272	3,674,591
274	3,674,592
276	3,674,593
299	3,674,594
306	3,674,595
321	3,674,596
331	3,674,597
345	3,674,598
380	3,674,601
	3,674,602
394	3,674,603
415	3,674,604
479	3,674,605
497	3,674,606
511	3,674,607
553	3,674,608
577	3,674,609
579	3,674,610
CLASS 160	
161	3,674,081
371	3,674,082
CLASS 161	
23	3,674,612
37	3,674,613
39	3,674,614
49	3,674,615
62	3,674,616
	3,674,617
63	3,674,611
64	3,674,618
119	3,674,619
133	3,674,620
160	3,674,622
164	3,674,623
165	3,674,624
	3,674,625
	3,674,626
175	3,674,627
178	3,674,628
214	3,674,629
CLASS 162	
30	3,674,630
146	3,674,621
149	3,674,631
168	3,674,632
342	3,674,633
CLASS 164	
251	3,674,083
271	3,674,084
333	3,674,085
CLASS 165	
1	3,674,086
2	3,674,087
CLASS 166	
192	3,674,088
245	3,674,089
271	3,674,092
276	3,674,090
299	3,674,093
314	3,674,091
CLASS 172	
4.5	3,674,094
7	3,674,095
805	3,674,096
CLASS 173	
149	3,674,098
CLASS 174	
15C	3,674,912
48	3,674,913
68.5	3,674,914
102R	3,674,915
169	3,674,916
CLASS 175	
20	3,674,099
69	3,674,100
389	3,674,101
CLASS 176	
3	3,674,634
77	3,674,636
78	3,674,635
	3,674,637
81	3,674,638
CLASS 177	
3	3,674,097
256	3,674,102
CLASS 178	
2R	3,674,917
5.2R	3,674,918
5.4CD	3,674,920
5.4R	3,674,919
	3,674,921
6	3,674,922
6.6R	3,674,923
6.8	3,674,924
	3,674,925
	3,674,926
7.001	3,674,927
7.1DC	3,674,931
7.3D	3,674,928
7.3R	3,674,929
7.5R	3,674,930
	3,674,932
69B	3,674,933
88	3,674,934
	3,674,935
CLASS 179	
1.5R	3,674,936
15AQ	3,674,938
15A	3,674,937
15.55R	3,674,939
18BA	Re.27,422
18ET	3,674,940
90AN	3,674,941
100.2C	3,674,943
	3,674,944
100.2Z	3,674,942
110A	3,674,945
115.5	3,674,946
175.2R	3,674,947
CLASS 180	
5R	3,674,103
	3,674,104
9.48	3,674,105
53	3,674,106
79.2R	3,674,107
CLASS 181	
.5EC	Re.27,418
31B	3,674,108
32R	3,674,109
CLASS 182	
46	3,674,110
72	3,674,111
CLASS 184	
6.1	3,674,112
CLASS 187	
29R	3,674,113
67	3,674,117
CLASS 188	
1A	3,674,114
1B	3,674,115
67	3,674,116
72.2	3,674,118
134	3,674,119
277	3,674,120
CLASS 192	
52	3,674,121
113A	3,674,122
CLASS 193	
23	3,674,123
25B	3,674,124
CLASS 195	
28N	3,674,641
28R	3,674,639
	3,674,640
	3,674,642
62	3,674,643
	3,674,644
66R	3,674,645
66	3,674,646
80R	3,674,647
104	3,674,649
127	3,674,648
CLASS 197	
19	3,674,125
55	3,674,126
CLASS 198	
19	3,674,127
33AA	3,674,128
44	3,674,129
195	3,674,130
230	3,674,131
CLASS 200	
50C	3,674,948
51.1	3,674,949
61.48	3,674,950
61.53	3,674,951
61.64	3,674,952
77	3,674,953
82B	3,674,955
82D	3,674,954
144AP	3,674,959
144B	3,674,958
148BV	3,674,957
148A	3,674,956
148R	3,674,964
153R	3,674,965
156	3,674,967
164	3,674,966
166C	3,674,969
166H	3,674,968
168C	3,674,960
	3,674,961
	3,674,970
172A	3,674,962
CLASS 202	
176	3,674,650
CLASS 203	
8	3,674,651
11	3,674,652
34	3,674,653
49	3,674,657
CLASS 204	
1T	3,674,654
1.5	3,674,655
13	3,674,656
30	3,674,658
52R	3,674,660
56R	3,674,659
73R	3,674,661
147	3,674,662
158R	3,674,663
	3,674,664
163R	3,674,665
164	3,674,666
165	3,674,667
171	3,674,668
180P	3,674,669
181	3,674,670
	3,674,671
195R	3,674,672
213	3,674,673
225	3,674,674
286	3,674,676
290R	3,674,675
299	3,674,678
302	3,674,677
CLASS 206	
1R	3,674,132
44	3,674,133
47A	3,674,134
58	3,674,135
65E	3,674,137
65S	3,674,136
80R	3,674,138
83.5	3,674,139
CLASS 208	
48	3,674,679
111	3,674,680
141	3,674,681
157	3,674,682
CLASS 209	
73	3,674,140
74	3,674,141
	3,674,142
	3,674,143
468	3,674,144
CLASS 210	
33	3,674,684
	3,674,685
37	3,674,686
40	3,674,683
73	3,674,145
	3,674,146
86	3,674,687
136	3,674,147
152	3,674,148
163	3,674,149
245	3,674,150
298	3,674,151
321	3,674,152
409	3,674,153
456	3,674,154
CLASS 211	
1.5	3,674,155
4	3,674,156
CLASS 212	
55	3,674,157
CLASS 214	
16.1CE	3,674,158
16.4A	3,674,159
17B	3,674,160
130R	3,674,161
138R	3,674,162
309	3,674,163
377	3,674,164
396	3,674,165
501	3,674,166
505	3,674,167
CLASS 217	
26.5	3,674,168
CLASS 219	
10.61	3,674,963
10.79	3,674,971
56	3,674,972
73	3,674,973
85	3,674,974
	3,674,975
86	3,674,976
121EB	3,674,977
121P	3,674,978
137	3,674,979
367	3,674,980
401	3,674,981
403	3,674,982
462	3,674,983
496	3,674,984
523	3,674,985
CLASS 220	
4R	3,674,169
18	3,674,170
54	3,674,171
	3,674,172
CLASS 221	
6	3,674,173
87	3,674,174
92	3,674,175
135	3,674,176
CLASS 222	
52	3,674,177
56	3,674,178
94	3,674,179
145	3,674,180
179.5	3,674,181
193	3,674,182
212	3,674,183
402.13	3,674,184
402.16	3,674,185
402.21	3,674,186
548	Re.27,419
CLASS 223	
46	3,674,187
CLASS 224	
5C	3,674,189
5E	3,674,190
5G	3,674,188
29R	3,674,191
CLASS 226	
11	3,674,192
100	3,674,193
187	3,674,194
CLASS 229	
66	3,674,195
CLASS 233	
4	3,674,196
14R	3,674,197
19A	3,674,206
26	3,674,198
CLASS 235	
	3,674,199
30A	3,674,986
60R	3,674,200
61PB	3,674,202
61PC	3,674,201
61.11E	3,674,990
61.6R	3,674,989
61.7	3,674,988
88	3,674,987
92PD	3,674,991

92TC 3,674,992
150.1 3,674,993
150.52 3,674,994
151.1 3,674,995
151.3 3,674,998
152 3,674,999
154 3,674,996
159 3,674,997
168 3,675,000
175 3,675,001
185 3,675,002
196 3,675,003

CLASS 236
38 3,674,203

CLASS 237
8 3,674,204

CLASS 239
1 3,674,205
69 3,674,207
77 3,674,208
143 3,674,209
204 3,674,210
247 3,674,211
308 3,674,212
425 3,674,213
526 3,674,214
548 3,674,215

CLASS 240
1.3 3,675,004
2 3,675,005
9R 3,675,006
11.2E 3,675,007
108 3,675,008

CLASS 241
18 3,674,216
21 3,674,217
46.06 3,674,218
152R 3,674,219
186R 3,674,220

CLASS 242
75.51 3,674,221
77.1 3,674,222
131 3,674,223

CLASS 244
12B 3,674,224
31 3,674,225
114R 3,674,226
121 3,674,227

CLASS 248
4 3,674,228
68 3,674,233
188 3,674,229
188.8 3,674,230
239 3,674,234
451 3,674,231

CLASS 249
23 3,674,232

CLASS 250
49.5ZC 3,675,010
3,675,011
49.5R 3,675,009
60 3,675,012
65T 3,675,013
66 3,675,014
71R 3,675,015
83.003 3,675,023
83.3D 3,675,019
83.3H 3,675,016
3,675,017
83.3R 3,675,018
93 3,675,020
106S 3,675,021
199 3,675,022
201 Re.27,421
208 3,675,024
211J 3,675,025
3,675,026
213VT 3,675,027
3,675,028
218 3,675,029
222R 3,675,030

CLASS 251
32 3,674,237
162 3,674,235
176 3,674,236
309 3,674,238

CLASS 252
8.8 3,674,688
12.4 3,674,689
25 3,674,690
47.5 3,674,691
56S 3,674,692
62.1 3,674,693
62.59 3,674,694
63.2 3,674,695
63.7 3,674,696
78 3,674,697
3,674,698
135 3,674,699
3,674,700
182 3,674,701
188 3,674,702
313R 3,674,703
316 3,674,704
400 3,674,705
412 3,674,706
413 3,674,707
432 3,674,708
454 3,674,709
465 3,674,710
500 3,674,711
501 3,674,712
520 3,674,713
543 3,674,714

CLASS 254
2R 3,674,239
95 3,674,240

CLASS 256
65 3,674,243

CLASS 259
15 3,674,241
158 3,674,242

CLASS 260
2EP 3,674,715
2.2R 3,674,728
2.5AB 3,674,716
2.5AC 3,674,721
2.5AQ 3,674,718
2.5AS 3,674,717
2.5BC 3,674,720
2.5M 3,674,719
3,674,722
3 3,674,723
3,674,724
9 3,674,725
17.4ST 3,674,726
22D 3,674,727
23AR 3,674,729
23EP 3,674,731
23XA 3,674,730
25 3,674,732
30.6R 3,674,733
31.2N 3,674,734
33.6AQ 3,674,735
41R 3,674,736
45.75K 3,674,737
46.5G 3,674,738
3,674,739
47CP 3,674,741
47XA 3,674,740
47P 3,674,742
73L 3,674,743
75NP 3,674,746
75UA 3,674,745
75M 3,674,744
75P 3,674,748
75R 3,674,747
77.5CH 3,674,749
77.5R 3,674,750
78L 3,674,751
78R 3,674,752
79 3,674,753
79.5B 3,674,754
80.78 3,674,755
80.81 3,674,756
82.1 3,674,759
83.7 3,674,760
86.7 3,674,757
87.3 3,674,761
87.5A 3,674,758
87.5 3,674,762
87.7 3,674,763
88.2R 3,674,764
88.2 3,674,765
3,674,766
89.1 3,674,767
91.3VA 3,674,768
93.7 3,674,769
119 3,674,770
206 3,674,771
207 3,674,772
210AB 3,674,774
210E 3,674,773
239.1 3,674,775
3,674,776
239.3D 3,674,777
239.55D 3,674,778
239.57 3,674,779
240D 3,674,781
240G 3,674,780
240.4 3,674,782
242 3,674,783
243C 3,674,784
243R 3,674,785
247.1 3,674,786
247.2A 3,674,787
250R 3,674,788
270 3,674,789
286R 3,674,790
287R 3,674,791
293.54 3,674,793
293.57 3,674,792
294.8E 3,674,795
294.8F 3,674,794
3,674,799
295AM 3,674,797
3,674,800
295.5S 3,674,796
297R 3,674,798
307D 3,674,803
307F 3,674,802
309.6 3,674,801
3,674,804
314.5R 3,674,805
326.15 3,674,808
3,674,809
326.5M 3,674,807
326.8 3,674,806
330.5 3,674,810
338 3,674,811
348R 3,674,812
348.5 3,674,813
396N 3,674,814
397 3,674,815
397.4 3,674,816
3,674,817
408 3,674,818
3,674,819
3,674,820
409 3,674,821
429K 3,674,824
429R 3,674,823
3,674,825
429.7 3,674,822
437S 3,674,826
453AL 3,674,829
453PC 3,674,827
453P 3,674,828
456P 3,674,830
468CB 3,674,831
469 3,674,832
470 3,674,833
471A 3,674,834
473G 3,674,836
473R 3,674,835
482C 3,674,838
482R 3,674,837
491 3,674,839
501.12 3,674,841
501.17 3,674,840
514R 3,674,842
519 3,674,843
3,674,844
524R 3,674,845
555A 3,674,847
558R 3,674,848
559S 3,674,849
3,674,850
561R 3,674,851
578 3,674,852
606.5B 3,674,853
606.5F 3,674,854
607A 3,674,855
3,674,856
609F 3,674,857
610D 3,674,858
619A 3,674,879
621R 3,674,880
632R 3,674,846
654H 3,674,881
665R 3,674,882
666A 3,674,883
669R 3,674,884
671B 3,674,885
677H 3,674,886
680E 3,674,887
681 3,674,889
681.5 3,674,888
683 3,674,890
827 3,674,891
835 3,674,892
836 3,674,893
875 3,674,894
878B 3,674,895
897B 3,674,896
976 3,674,897

CLASS 261
18B 3,674,244
28 3,674,245
114R 3,674,246

CLASS 264
146 3,674,898
315 3,674,899

CLASS 266
4E 3,674,247
41 3,674,248

CLASS 267
52 3,674,249
61 3,674,250
162 3,674,251

CLASS 269
55 3,674,252

CLASS 270
31 3,674,253
79 3,674,254

CLASS 271
29 3,674,255
63 3,674,256
64 3,674,257
77 3,674,258
84 3,674,259

CLASS 272
1R 3,674,260
79A 3,674,261
85 3,674,262

CLASS 273
1R 3,674,263
3,674,264
43A Re.27,416
55R 3,674,265
73R 3,674,266
75 3,674,267
76 3,674,268
86R 3,674,269
101 3,674,270
115 3,674,271
130A 3,674,272
134AA 3,674,273
135AC 3,674,274
138R 3,674,275
157R 3,674,276

CLASS 274
1L 3,674,277
39A 3,674,278

CLASS 277
95 3,674,279

CLASS 279
2 3,674,280
30 3,674,281

CLASS 280
124F 3,674,282
124R 3,674,283
3,674,285
150AB 3,674,284

CLASS 281
2 3,674,286

CLASS 285
7 3,674,287
24 3,674,288
174 3,674,292
248 3,674,290
367 3,674,291

CLASS 287
56 3,674,293
58CT 3,674,294
189.36B 3,674,289

CLASS 290
1 3,675,031
38C 3,675,032
38 3,675,033

CLASS 292
76 3,674,295
216 3,674,296
252 3,674,297
258 3,674,298
262 3,674,299

CLASS 294
31.2 3,674,300
82 3,674,301
118 3,674,302

CLASS 296
24C 3,674,303
27 3,674,305
43 3,674,304

CLASS 297
17 3,674,306
284 3,674,307
345 3,674,308
379 3,674,309
397 3,674,310
440 3,674,311

CLASS 298
8T 3,674,312

CLASS 299
13 3,674,313
86 3,674,314

CLASS 301
65 3,674,315

CLASS 302
3,674,316

CLASS 303
21CG 3,674,319
21A 3,674,318
21F 3,674,317
21P 3,674,320
28 3,674,321

CLASS 305
38 3,674,322

CLASS 307
9 3,675,034
10AT 3,675,035
3,675,036
51 3,675,037
66 3,675,038
88.3 3,675,039
133 3,675,040
141 3,675,041
147 3,675,042
205 3,675,043
221B 3,675,044
235 3,675,045
252B 3,675,046
260. 3,675,047
261 3,675,048
293 3,675,049
304 3,675,050
308 3,675,051

CLASS 308
3A 3,674,323
6R 3,674,324
35 3,674,325
36.1 3,674,326
122 3,674,355
187 3,674,356
233 3,674,357

CLASS 310
8.1 3,675,052
8.2 3,675,053
9.8 3,675,054
22 3,675,055
54 3,675,056
68D 3,675,057
71 3,675,058
156 3,675,059
172 3,675,060
266 3,675,102

CLASS 312
126 3,674,358
214 3,674,359
222 3,674,360
257 3,674,327
263 3,674,328
319 3,674,329

CLASS 313
63 3,675,061
65 3,675,062
104 3,675,063
108D 3,675,064
109.005 3,675,065
109.5 3,675,066
174 3,675,067
217 3,675,068
268 3,675,069
279 3,675,070

CLASS 315
10 3,675,071
13C Re.27,417
111 3,675,072
149 3,675,073
159 3,675,074
169 3,675,075
200F 3,675,076
209R 3,675,077
289 3,675,078

CLASS 317
11A 3,675,079
13R 3,675,080
15 3,675,081
20 3,675,082
101CB 3,675,084
101 3,675,083
106 3,675,085
230 3,675,086
3,675,087
234R 3,675,088
3,675,089
3,675,090
235R 3,675,091
3,675,092
249R 3,675,093
258 3,675,094
261 3,675,095
262A 3,675,096

CLASS 318
17 3,675,097
85 3,675,098
211 3,675,099
220R 3,675,100
266 3,675,101
281 3,675,103
345 3,675,104
356 3,675,105
443 Re.27,423
3,675,106
601 3,675,107

CLASS 320
2 3,675,108

CLASS 321
3,675,109
14 3,675,110
18 3,675,111

CLASS 322
4 3,675,112
28 3,675,113
31 3,675,117

CLASS 323
6 3,675,115
9 3,675,114
17 3,675,116
48 3,675,119

CLASS 324
37 3,675,118
57 3,675,124
61R 3,675,120
3,675,121
62 3,675,122
96 3,675,123
3,675,125
168 3,675,126
186 3,675,127

CLASS 325
1 3,675,128
174 3,675,130
320 3,675,129
329 3,675,131
423 3,675,132

CLASS 328
55 3,675,133
124 3,675,134
133 3,675,136
144 3,675,137
151 3,675,135
163 3,675,138

CLASS 329
104 3,675,139

CLASS 330
5.5 3,675,140
13 3,675,141
17 3,675,142
18 3,675,143
40 3,675,144
124R 3,675,145

CLASS 331
1R 3,675,146
8 3,675,147
78 3,675,148
94 3,675,149
94.5 3,675,150
3,675,151
3,675,152
3,675,153
3,675,154
3,675,155
3,675,156
3,675,157
109 3,675,158
3,675,159
113R 3,675,160

CLASS 332
16R 3,675,161
23 3,675,162

CLASS 333
30R 3,675,163
32 3,675,164
98P 3,675,165

CLASS 335
164 3,675,166
179 3,675,167
198 3,675,168
205 3,675,169
207 3,675,170
232 3,675,171
257 3,675,172
268 3,675,173
299 3,675,174

CLASS 336
70 3,675,175
182 3,675,176

CLASS 337
66 3,675,177
348 3,675,178

CLASS 338
190 3,675,179

CLASS 339
17F 3,675,180
32R 3,675,181
98 3,675,182
103B 3,675,184
103R 3,675,183
126RS 3,675,185
186M 3,675,186
211 3,675,187
220R 3,675,188
221R 3,675,189

CLASS 340
1R 3,675,191
1 3,675,190
3D 3,675,192
10 3,675,193
15.5DP 3,675,194
38L 3,675,195
40 3,675,196
52A 3,675,197
58 3,675,198
62 3,675,199
146.1AQ 3,675,202
146.1F 3,675,200
146.3AG 3,675,201
146.3AQ 3,675,203
147R 3,675,204
147 3,675,205
149A 3,675,206
172.5 3,675,207
3,675,208
3,675,209

	3,675,210
	3,675,211
	3,675,212
	3,675,213
	3,675,214
	3,675,215
	3,675,216
	3,675,217
173FF	3,675,218
173RC	3,675,219
173.2	3,675,220
174MA	3,675,222
174TB	3,675,221
174S	3,675,223
174	3,675,224
196	3,675,225
244A	3,675,227
258B	3,675,233
259	3,675,228
267R	3,675,229
324A	3,675,230
	3,675,231
	3,675,232
347DA	3,675,234
347DD	3,675,236
347SY	3,675,238
347P	3,675,235
357R	3,675,237
365	3,675,239
	3,675,240
366	3,675,241
381	3,675,242
384E	3,675,243
CLASS 343	
225	3,675,226
CLASS 350	
2	3,674,330
3.5	3,674,331
	3,674,332
5	3,674,333
55	3,674,334
96WG	3,674,335
	3,674,336
	3,674,337
117	3,674,338
130	3,674,339
157	3,674,340
160R	3,674,342
160	3,674,341
250	3,674,343
312	3,674,344
CLASS 352	
12	3,674,346
31	3,674,345
73	3,674,347
84	3,674,348
91	3,674,349
CLASS 353	
27	3,674,350
	3,674,351
CLASS 355	
3	3,674,352
	3,674,353
5	3,674,354
8	3,674,361
10	3,674,362
14	3,674,363
38	3,674,364
40	3,674,365
55	3,674,366
77	3,674,367
78	3,674,368
CLASS 356	
2	3,674,369
36	3,674,370
106	3,674,371
130	3,674,373
169	3,674,372
CLASS 401	
8	3,674,374
CLASS 408	
103	3,674,375
115	3,674,376
CLASS 415	
147	3,674,377
CLASS 416	
177	3,674,378
226	3,674,379
CLASS 417	
92	3,674,380
234	3,674,381
372	3,674,382
476	3,674,383
CLASS 418	
120	3,674,384
177	3,674,385
CLASS 424	
1	3,674,900
27	3,674,901
70	3,674,902
80	3,674,859
88	3,674,860
89	3,674,861
	3,674,862
90	3,674,864
92	3,674,863
99	3,674,865
118	3,674,866
122	3,674,867
	3,674,868
175	3,674,869
229	3,674,872
230	3,674,870
246	3,674,876
250	3,674,873
263	3,674,877
270	3,674,871
273	3,674,874
285	3,674,875
330	3,674,878
CLASS 425	
1	3,674,386
4	3,674,387
72	3,674,388
79	3,674,389
	3,674,390
80	3,674,599
109	3,674,391
	3,674,392
110	3,674,393
112	3,674,394
115	3,674,395
117	3,674,396
145	3,674,397
159	3,674,398
166	3,674,399
225	3,674,400
244	3,674,401
306	3,674,402
308	3,674,405
326	3,674,404
330	3,674,403
353	3,674,406
378	3,674,407
406	3,674,408
CLASS 431	
1	3,674,409
74	3,674,410
93	3,674,411
124	3,674,412
344	3,674,413

CLASSIFICATION OF DESIGNS

D 1—	1	224,077
D 6—	8	224,079
D 8—	14	224,080
	208	224,081
	229	224,082
	233	224,083
	235	224,084
	259	224,085
	266	224,086
D 9—	10	224,087
	40	224,088
	254	224,090
	257	224,091
	258	224,092
	291	224,093
D02—	400	224,078
D13—	1	224,094
		224,095
D14—	3	224,096
		224,097
		224,098
	6	224,099
	30	224,100
		224,101
D16—	2	224,102
	3	224,103
D22—	28	224,104
D23—	4	224,105
	21	224,106
	44	224,107
	65	224,108
D26—	1	224,109
	5	224,110
		224,111
		224,112
	13	224,113
		224,114
		224,115
	14	224,116
		224,117
	15	224,118
D29—	28	224,119
		224,120
D34—	4	224,121
	5	224,122
		224,123
	15	224,089
		224,124
		224,125
		224,126
		224,127
D41—	1	224,128
		224,129
D42—	7	224,130
	8	224,131
D44—	1	224,132
		224,133
	6	224,134
	15	224,135
		224,136
	21	224,137
	31	224,138
D48—	20	224,139
		224,140
		224,141
	32	224,142
		224,143
D49—	30	224,144
D52—	3	224,145
	6	224,146
	7	224,147
		224,148
D54—	2	224,149
		224,150
D55—	1	224,151
		224,152
		224,153
D56—		224,154
		224,155
	4	224,156
		224,157
		224,158
		224,159
		224,161
D57—	1	224,160
D61—		224,162
		224,163
		224,164
		224,165
		224,166
D71—		224,167
D74—	5	224,168
D77—	1	224,169
		224,170
D80—	2	224,171
D83—	1	224,172
	12	224,173
D85—	8	224,174
D86—	10	224,175
		224,176
D87—	1	224,177
		224,178
D89—		224,179
D90—	20	224,180
		224,181

CLASSIFICATION OF PLANTS

P. —	11	03,226
P. —	15	03,228
P. —	20	03,227
P. —	22	03,229
P. —	43	03,230
P. —	76	03,224
P. —	79	03,225

GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

1 : 3,673,896	3,674,075	3,674,909	3,674,154	3,674,298	3,674,021
3,674,913	3,674,111	3,674,910	3,674,197	3,674,299	3,674,045
3,675,182	3,674,115	3,674,917	3,674,212	3,674,321	3,674,060
4 : 3,673,742	3,674,123	3,674,920	3,674,254	3,674,344	3,674,081
3,673,770	3,674,134	3,674,923	3,674,325	3,674,422	3,674,094
3,675,005	3,674,142	3,674,925	3,674,334	3,674,431	3,674,122
3,675,064	3,674,152	3,674,945	3,6 74,356	3,674,590	3,674,131
3,675,065	3,674,153	3,674,979	3,674,367	3,674,752	3,674,156
3,675,066	3,674,158	3,674,982	3,674,463	3,674,780	3,674,162
3,675,193	3,674,189	3,674,998	3,674,569	3,674,953	3,674,163
3,675,232	3,674,216	3,675,019	3,674,583	3,674,961	3,674,184
6 : Re.27,424	3,674,227	3,675,022	3,674,587	3,675,012	3,674,185
3,673,613	3,674,237	3,675,028	3,674,607	3,675,077	3,674,186
3,673,618	3,674,259	3,675,042	3,674,635	3,675,226	3,674,187
3,673,644	3,674,270	3,675,047	3,674,718	13 : 3,673,778	3,674,226
3,673,680	3,674,271	3,675,052	3,674,824	3,674,136	3,674,231
3,673,693	3,674,281	3,675,063	3,674,827	3,674,172	3,674,273
3,673,695	3,674,288	3,675,071	3,674,848	3,675,175	3,674,279
3,673,698	3,674,291	3,675,076	3,674,876	15 : 3,674,260	3,674,290
3,673,704	3,674,297	3,675,092	3,674,950	16 : 3,674,596	3,674,328
3,673,752	3,674,304	3,675,121	3,674,990	17 : 3,673,610	3,674,347
3,673,758	3,674,306	3,675,129	3,675,038	3,673,678	3,674,348
3,673,803	3,674,308	3,675,137	3,675,112	3,673,685	3,674,396
3,673,807	3,674,311	3,675,141	3,675,148	3,673,686	3,674,397
3,673,812	3,674,341	3,675,149	3,675,151	3,673,696	3,674,469
3,673,833	3,674,346	3,675,170	3,675,152	3,673,697	3,674,473
3,673,842	3,674,354	3,675,183	10 : 3,674,443	3,673,723	3,674,508
3,673,855	3,674,355	3,675,204	3,674,447	3,673,724	3,674,511
3,673,863	3,674,368	3,675,210	3,674,484	3,673,735	3,674,523
3,673,871	3,674,371	3,675,215	3,674,515	3,673,738	3,674,547
3,673,872	3,674,378	3,675,220	3,674,526	3,673,757	3,674,555
3,673,873	3,674,407	3,675,221	3,674,534	3,673,775	3,674,571
3,673,881	3,674,438	8 : 3,673,714	3,674,560	3,673,779	3,674,572
3,673,899	3,674,504	3,674,358	3,674,627	3,673,787	3,674,573
3,673,901	3,674,510	3,674,665	3,674,705	3,673,796	3,674,574
3,673,924	3,674,550	3,674,922	3,674,719	3,673,799	3,674,630
3,673,928	3,674,554	3,675,124	3,674,721	3,673,845	3,674,657
3,673,931	3,674,591	3,675,133	3,674,749	3,673,860	3,674,680
3,673,932	3,674,601	3,675,213	3,674,758	3,673,895	3,674,691
3,673,933	3,674,648	9 : 3,673,721	11 : 3,674,458	3,673,922	3,674,693
3,673,943	3,674,662	3,673,756	3,674,524	3,673,934	3,674,725
3,673,944	3,674,663	3,673,762	12 : 3,673,707	3,673,936	3,674,773
3,673,975	3,674,682	3,673,771	3,673,783	3,673,948	3,674,818
3,674,020	3,674,700	3,673,800	3,673,870	3,673,957	3,674,879
3,674,028	3,674,711	3,673,801	3,673,894	3,673,959	3,674,948
3,674,035	3,674,742	3,673,848	3,673,982	3,673,968	3,674,966
3,674,037	3,674,778	3,673,859	3,674,009	3,673,980	3,674,969
3,674,043	3,674,789	3,673,984	3,674,036	3,673,991	3,674,970
3,674,053	3,674,816	3,674,019	3,674,103	3,673,992	3,674,972
3,674,061	3,674,820	3,674,034	3,674,225	3,673,996	3,675,006
3,674,062	3,674,826	3,674,056	3,674,287	3,674,007	3,675,007

3,675,041
3,675,081
3,675,098
3,675,120
3,675,146
3,675,169
3,675,243
18 : 3,673,699
3,673,722
3,673,883
3,673,950
3,673,963
3,673,998
3,674,041
3,674,055
3,674,067
3,674,114
3,674,121
3,674,242
3,674,301
3,674,305
3,674,318
3,674,320
3,674,446
3,674,567
3,674,774
3,674,775
3,674,784
3,674,788
3,674,862
3,674,869
3,674,932
3,674,992
3,675,095
19 : 3,673,637
3,673,798
3,673,861
3,674,071
3,674,095
3,674,105
3,674,578
3,674,860
3,674,962
3,675,198
20 : 3,673,615
3,673,668
3,673,952
3,673,967
3,674,093
3,674,108
3,674,155
3,674,164
3,674,278
3,674,303
3,674,388
3,674,761
3,675,162
21 : 3,673,823
3,673,906
3,674,125
3,674,359
3,674,983
3,675,085
22 : 3,673,614
3,673,720
3,673,900
3,674,089
3,674,137
3,674,150
3,674,312
3,674,425
3,674,433
3,674,546
3,674,846
3,674,880
23 : 3,674,726
24 : 3,673,777
3,673,813
3,673,814
3,673,862
3,673,921
3,674,070
3,674,191
3,674,289
3,674,556
3,674,557
3,674,570
3,674,619
3,674,684
3,674,687
3,674,702
3,674,934
3,674,971
3,675,020
3,675,030
3,675,126
3,675,138
25 : 3,673,612
3,673,667
3,673,681
3,673,706
3,673,709
3,673,747
3,673,802
3,673,809
3,673,844

3,673,915
3,673,935
3,673,942
3,673,955
3,673,966
3,674,012
3,674,013
3,674,015
3,674,018
3,674,023
3,674,139
3,674,147
3,674,195
3,674,233
3,674,330
3,674,331
3,674,373
3,674,401
3,674,440
3,674,452
3,674,455
3,674,477
3,674,478
3,674,482
3,674,486
3,674,489
3,674,530
3,674,622
3,674,666
3,674,678
3,674,809
3,674,822
3,674,907
3,674,930
3,674,939
3,674,955
3,674,956
3,674,959
3,675,000
3,675,032
3,675,061
3,675,083
3,675,100
3,675,115
3,675,116
3,675,155
3,675,196
3,675,203
26 : 3,673,634
3,673,656
3,673,660
3,673,661
3,673,669
3,673,684
3,673,759
3,673,772
3,673,817
3,673,824
3,673,832
3,673,857
3,673,875
3,673,891
3,673,903
3,673,949
3,673,969
3,673,978
3,674,044
3,674,048
3,674,059
3,674,082
3,674,120
3,674,127
3,674,229
3,674,230
3,674,238
3,674,249
3,674,263
3,674,284
3,674,296
3,674,300
3,674,309
3,674,357
3,674,380
3,674,385
3,674,419
3,674,423
3,674,441
3,674,610
3,674,614
3,674,647
3,674,654
3,674,664
3,674,672
3,674,673
3,674,734
3,674,777
3,674,795
3,674,812
3,674,834
3,674,836
3,674,838
3,674,857
3,674,858
3,674,863
3,674,889
3,674,893

3,674,954
3,675,034
3,675,090
3,675,099
3,675,101
3,675,201
27 : Re.27,421
3,673,701
3,673,715
3,673,867
3,673,962
3,673,965
3,673,976
3,674,025
3,674,051
3,674,133
3,674,161
3,674,177
3,674,316
3,674,434
3,674,497
3,674,506
3,674,785
3,674,898
3,674,946
3,674,963
3,675,046
3,675,122
3,675,184
3,675,234
28 : 3,674,064
3,674,073
29 : 3,673,626
3,673,893
3,673,914
3,674,052
3,674,165
3,674,211
3,674,214
3,674,261
3,674,264
3,674,322
3,674,404
3,674,459
3,674,460
3,674,501
3,674,606
3,674,620
3,674,688
3,674,766
3,674,770
3,674,802
3,674,804
3,674,849
3,675,015
3,675,108
30 : 3,674,375
31 : 3,674,104
3,674,190
32 : 3,673,795
3,674,313
3,675,036
33 : 3,673,712
3,674,110
3,674,938
3,674,965
34 : Re.27,422
3,673,652
3,673,713
3,673,751
3,673,760
3,673,763
3,673,768
3,673,776
3,673,820
3,673,851
3,673,868
3,673,874
3,673,953
3,673,960
3,673,970
3,673,983
3,674,024
3,674,039
3,674,074
3,674,124
3,674,132
3,674,135
3,674,159
3,674,173
3,674,176
3,674,215
3,674,250
3,674,251
3,674,282
3,674,332
3,674,335
3,674,336
3,674,337
3,674,342
3,674,345
3,674,360
3,674,364
3,674,366
3,674,381
3,674,384

3,674,392
3,674,415
3,674,420
3,674,427
3,674,450
3,674,466
3,674,488
3,674,492
3,674,528
3,674,542
3,674,551
3,674,568
3,674,581
3,674,597
3,674,598
3,674,611
3,674,623
3,674,656
3,674,686
3,674,696
3,674,735
3,674,794
3,674,796
3,674,800
3,674,807
3,674,814
3,674,821
3,674,832
3,674,843
3,674,844
3,674,856
3,674,867
3,674,870
3,674,875
3,674,878
3,674,882
3,674,896
3,674,901
3,674,904
3,674,935
3,674,943
3,674,974
3,674,976
3,675,025
3,675,037
3,675,039
3,675,048
3,675,068
3,675,078
3,675,096
3,675,127
3,675,132
3,675,134
3,675,135
3,675,144
3,675,145
3,675,154
3,675,156
3,675,157
3,675,158
3,675,159
3,675,164
3,675,174
3,675,214
3,675,236
3,675,240
3,675,241
35 : 3,673,729
3,674,017
36 : Re.27,423
3,673,619
3,673,621
3,673,630
3,673,632
3,673,711
3,673,731
3,673,733
3,673,734
3,673,753
3,673,769
3,673,773
3,673,853
3,673,858
3,673,865
3,673,887
3,673,909
3,673,938
3,673,939
3,673,940
3,673,941
3,673,961
3,673,986
3,674,004
3,674,010
3,674,022
3,674,033
3,674,046
3,674,063
3,674,087
3,674,128
3,674,175
3,674,203
3,674,210
3,674,223
3,674,234
3,674,255

3,674,266
3,674,269
3,674,272
3,674,274
3,674,280
3,674,310
3,674,324
3,674,333
3,674,353
3,674,361
3,674,363
3,674,376
3,674,399
3,674,429
3,674,435
3,674,451
3,674,475
3,674,487
3,674,502
3,674,532
3,674,575
3,674,602
3,674,616
3,674,631
3,674,650
3,674,669
3,674,671
3,674,681
3,674,697
3,674,698
3,674,737
3,674,739
3,674,743
3,674,748
3,674,782
3,674,793
3,674,798
3,674,805
3,674,853
3,674,891
3,674,894
3,674,914
3,674,916
3,674,921
3,674,927
3,674,931
3,675,001
3,675,003
3,675,011
3,675,014
3,675,016
3,675,017
3,675,026
3,675,045
3,675,055
3,675,056
3,675,058
3,675,069
3,675,093
3,675,107
3,675,114
3,675,128
3,675,131
3,675,136
3,675,140
3,675,143
3,675,150
3,675,153
3,675,181
3,675,190
3,675,200
3,675,211
3,675,212
3,675,217
3,675,218
37 : 3,674,069
3,674,257
3,674,456
3,674,806
3,675,097
39 : Re.27,416
Re.27,419
3,673,642
3,673,664
3,673,673
3,673,710
3,673,730
3,673,732
3,673,737
3,673,739
3,673,740
3,673,743
3,673,746
3,673,749
3,673,797
3,673,811
3,673,852
3,673,878
3,673,889
3,673,908
3,673,910
3,673,925
3,673,929
3,673,954
3,673,981
3,674,001

3,674,066
3,674,076
3,674,085
3,674,112
3,674,148
3,674,166
3,674,205
3,674,221
3,674,247
3,674,268
3,674,283
3,674,314
3,674,338
3,674,394
3,674,467
3,674,535
3,674,537
3,674,563
3,674,579
3,674,589
3,674,599
3,674,676
3,674,690
3,674,704
3,674,720
3,674,729
3,674,736
3,674,760
3,674,881
3,674,906
3,674,911
3,674,924
3,674,989
3,675,035
3,675,103
3,675,105
3,675,106
3,675,160
3,675,166
3,675,178
3,675,187
3,675,197
3,675,239
40 : 3,673,850
3,674,092
3,674,188
3,674,235
3,674,246
3,674,437
3,674,525
3,674,661
3,674,668
3,674,706
3,674,750
3,674,753
3,674,887
3,674,915
3,675,009
41 : 3,673,687
3,673,708
3,674,011
3,674,119
3,674,220
3,674,374
42 : Re.27,420
3,673,609
3,673,617
3,673,627
3,673,633
3,673,654
3,673,675
3,673,694
3,673,725
3,673,816
3,673,854
3,673,869
3,673,880
3,673,913
3,673,917
3,674,002
3,674,016
3,674,027
3,674,068
3,674,084
3,674,086
3,674,107
3,674,138
3,674,141
3,674,143
3,674,160
3,674,167
3,674,183
3,674,193
3,674,206
3,674,207
3,674,248
3,674,258
3,674,262
3,674,276
3,674,277
3,674,292
3,674,406
3,674,411
3,674,448
3,674,464
3,674,498

3,674,516
3,674,517
3,674,536
3,674,545
3,674,562
3,674,564
3,674,566
3,674,580
3,674,645
3,674,652
3,674,670
3,674,675
3,674,701
3,674,715
3,674,723
3,674,727
3,674,733
3,674,757
3,674,790
3,674,792
3,674,831
3,674,885
3,674,903
3,674,912
3,674,936
3,674,964
3,674,975
3,674,988

3,675,004
3,675,044
3,675,110
3,675,113
3,675,118
3,675,172
3,675,185
3,675,186
3,675,199
3,675,208
3,675,209
3,675,242
44 : 3,674,267
3,674,717
3,674,724
3,675,049
3,675,189
45 : 3,673,611
3,673,622
3,673,780
3,674,079
3,674,417
3,674,418
3,674,548
3,674,584
3,674,618
3,674,993

46 : 3,675,229
47 : 3,674,219
3,674,243
3,674,791
3,674,987
3,675,072
48 : Re.27,418
3,673,676
3,673,679
3,673,767
3,673,785
3,673,804
3,673,815
3,673,828
3,673,864
3,673,946
3,673,974
3,674,005
3,674,090
3,674,091
3,674,149
3,674,178
3,674,228
3,674,265
3,674,432
3,674,445
3,674,585
3,674,600

3,674,677
3,674,708
3,674,712
3,674,765
3,674,854
3,674,895
3,674,905
3,674,984
3,674,995
3,675,043
3,675,051
3,675,054
3,675,163
3,675,216
49 : 3,673,827
3,674,294
3,674,442
3,674,503
50 : 3,674,097
51 : 3,673,640
3,673,648
3,673,672
3,673,689
3,673,766

3,673,834
3,673,835
3,674,042
3,674,113
3,674,559
3,674,683
3,674,722
3,674,919
3,674,926
3,674,999
3,675,117
52 : 3,673,912
3,673,945
3,673,973
3,674,323
3,674,565
53 : 3,673,671
3,673,688
3,673,727
3,673,744
3,673,764
3,673,793
3,673,794
3,673,930
3,674,008
3,674,065
3,674,157

54 : 3,673,670
3,673,719
3,674,428
3,674,825
55 : 3,673,639
3,673,726
3,673,728
3,673,890
3,673,902
3,673,918
3,674,026
3,674,029
3,674,096
3,674,145
3,674,169
3,674,179
3,674,181
3,674,352
3,674,457
3,674,595
3,674,608
3,674,612
3,674,617
3,674,626
3,674,667
3,674,958
3,675,008
3,675,073
3,675,104
3,675,205
3,675,237

DESIGN PATENTS

2 : 224,149
4 : 224,134
6 : 224,083
224,085
224,092
224,099
224,100
224,101
224,105
224,112
224,118
224,130
224,135
224,140
224,141

224,150
224,156
224,162
224,166
224,172
224,174
224,177
8 : 224,121
9 : 224,081
224,175
12 : 224,086
224,115
224,171
13 : 224,094
224,179

17 : 224,077
224,088
224,093
224,107
224,113
224,120
224,124
18 : 224,103
19 : 224,137
20 : 224,155
224,176
22 : 224,151
224,152
224,153
25 : 224,106

224,110
224,119
224,160
26 : 224,096
224,111
224,127
224,146
224,154
224,180
224,181
27 : 224,109
29 : 224,122
31 : 224,114
224,125
34 : 224,117

224,147
36 : 224,080
224,136
224,142
224,143
224,157
224,158
224,165
224,168
37 : 224,178
39 : 224,091
224,138
224,148
40 : 224,084
224,098

224,144
42 : 224,078
224,079
224,102
224,128
224,129
44 : 224,133
48 : 224,104
224,145
49 : 224,095
53 : 224,082
55 : 224,090
224,108
224,123
224,170

PLANT PATENTS

6 : 03,230

U.S. GOVERNMENT PRINTING OFFICE: 0—1972

U. S. DEPARTMENT OF COMMERCE
Peter G. Peterson, *Secretary*

PATENT OFFICE
Robert Gottschalk, *Commissioner*